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Volume I.

TRANSCRIPT OF RECORD.

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1907.

No. 202.

CONTINENTAL PAPER BAG COMPANY, PETITIONER,

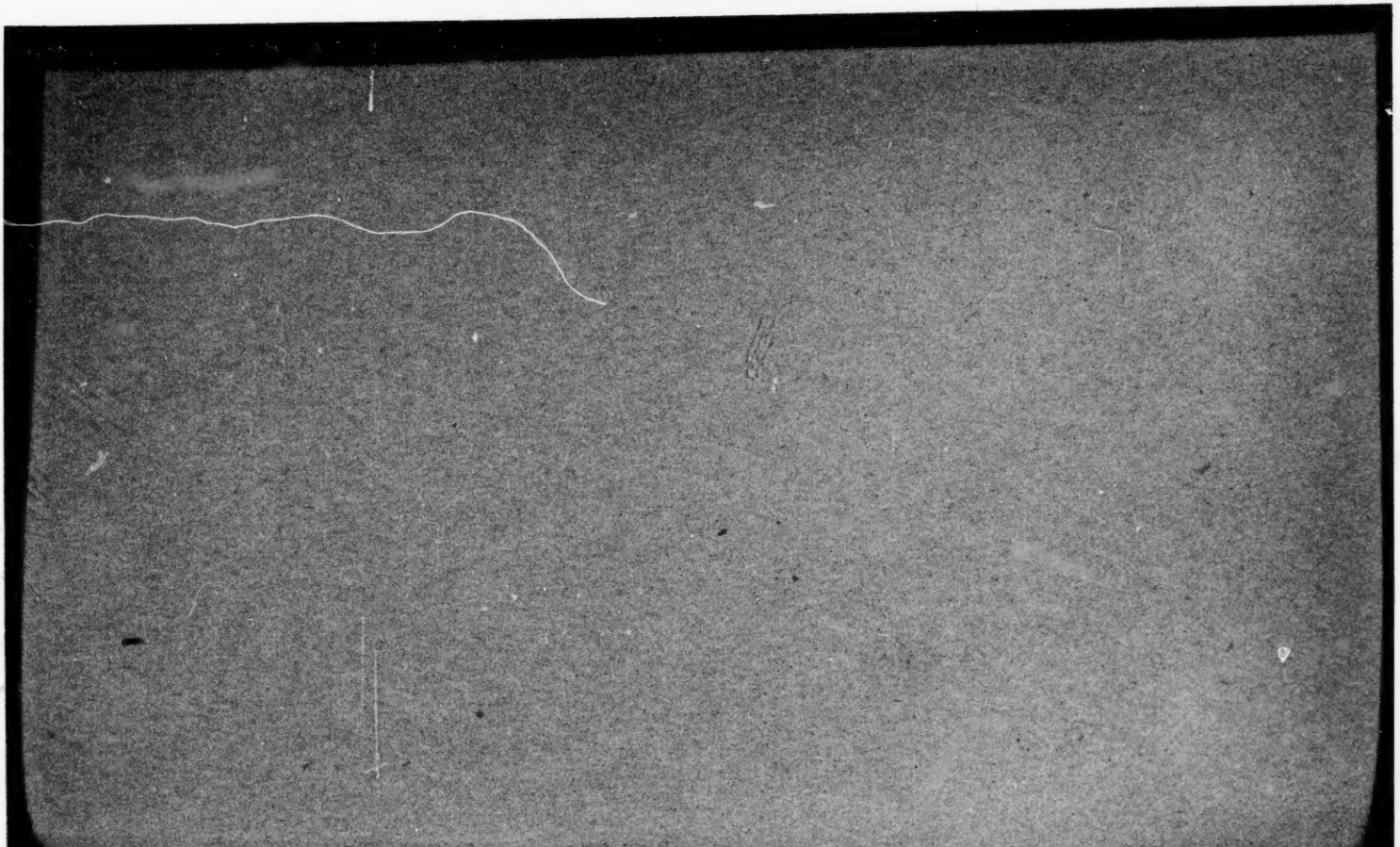
vs.

EASTERN PAPER BAG COMPANY.

ON WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE FIRST CIRCUIT.

PETITION FOR CERTIORARI FILED JANUARY 16, 1907.
CERTIORARI AND RETURN FILED MARCH 30, 1907.

(20,533.)



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United States Circuit Court of Appeals for the First Circuit, October Term, 1905.

No. 635.

CONTINENTAL PAPER BAG COMPANY, Defendant, Appellant,
v.
EASTERN PAPER BAG COMPANY, Complainant, Appellee.

Appeal from the Circuit Court of the United States for the District of Maine.

From Interlocutory Decree (Putnam, J.), December 28, 1905.

TRANSCRIPT OF RECORD.

VOLUME I.

COMPLAINANT'S RECORD.

Prima Facie Proofs.

Albert H. Walker, for Defendant, Appellant.
Francis T. Chambers, Samuel R. Betts, Betts, Sheffield & Betts, for Complainant, Appellee.

b Circuit Court of the United States, District of Maine. In Equity.

EASTERN PAPER BAG COMPANY, Complainant,
vs.
CONTINENTAL PAPER BAG COMPANY, Defendant.

On Liddell Patent No. 558,969.

VOLUME I.

COMPLAINANT'S RECORD.

Prima Facie Proofs.

Betts, Betts, Sheffield & Betts, Solicitors for Complainant, 120 Broadway, New York City.

1 Circuit Court of the United States for the District of Maine, in the First Circuit.

Bill in Equity on Letters Patent No. 558,969.

EASTERN PAPER BAG COMPANY
vs.
CONTINENTAL PAPER BAG COMPANY.

Bill of Complaint.

[Filed October 11, 1901.]

To the Honorable the Judges of the Circuit Court of the United States for the District of Maine in the First Circuit.

The Eastern Paper Bag Company, a corporation duly organized and existing under and by virtue of the laws of the State of Connecticut, a citizen of said State having its principal place
2 of business in the city of Boston and State of Massachusetts, brings this its bill of complaint in equity against the Continental Paper Bag Company, a corporation organized and existing under and by virtue of the laws of the State of Maine, a citizen of said State and a resident and inhabitant of the State and District of Maine.

And thereupon your orator complains and says upon information and belief.

That heretofore and before the 6th day of February, 1896, William Liddell, being then a citizen of the United States, was the sole, true, original and first inventor or discoverer of certain new and useful improvements in paper-bag machines, which were not known or used by others in this country, and not patented nor described in any printed publication in this or any foreign country before his invention or discovery thereof, and which were not and had not been in public use or on sale for more than two years prior to his application for Letters Patent of the United States therefor; nor contrary to the provision of the statutes of the United States in such case made and provided; and had not been abandoned to the public.

That the said William Liddell, on the 6th day of February, 1896, being then, as aforesaid, the sole, first, true and original inventor or discoverer of the said improvements in paper-bag machines, made application in writing to the Commissioner of Patents of the United States for the grant of Letters Patent upon said inventions and improvements or discoveries, and prior to the granting of the Letters Patent next hereinafter mentioned, duly complied in all respects with all the conditions and requirements of the statutes of the United States in such case made and provided.

That before the issuing of the next hereinafter mentioned Letters Patent, the said William Liddell by an instrument in writing, duly signed, sealed, delivered and recorded in the United States Patent Office did sell, assign and transfer to the Eastern Paper Bag Com-

pany all the right, title and interest in, to and under said application for Letters Patent of the United States and the inventions and improvements or discoveries therein set forth, and in and to
3 any and all Letters Patent of the United States to be obtained therefor; and your orator prays that the said instrument in writing may be deemed and taken as part of this bill, and to the original, or a duly authenticated copy thereof, now in your orator's possession and ready in court to be produced, your orator prays leave to refer.

That on the 28th day of April, 1896, after due examination as to the novelty and utility of the said inventions and improvements or discoveries and in full compliance with the Statutes of the United States, in such case made and provided, Letters Patent of the United States, bearing date on that day, were issued to the said William Liddell, assignor to the Eastern Paper Bag Company, your orator, whereby there was granted to the Eastern Paper Bag Company, its successors or assigns, for the term of seventeen years from the 28th day of April, 1896, the full and exclusive right and liberty of making, constructing, using and vending to others to be used throughout the United States and the Territories thereof, the inventions and improvements or discoveries aforesaid, a true and complete description whereof is given in the words of the said William Liddell in the schedule annexed to said Letters Patent and made a part of the same.

That said Letters Patent were issued in the name of the United States of America and were signed by the Secretary of the Interior, and were countersigned and sealed with the seal of the Patent Office by the Commissioner of Patents, and were numbered 558,969, and were issued and delivered to the said William Liddell, assignor to the Eastern Paper Bag Company.

That after the issuing of the said Letters Patent the said inventions or discoveries were put into use by your orator.

That your orator prays that said Letters Patent and the schedule annexed thereto as aforesaid, may be deemed and taken as part of this bill; and to the originals of the same, or duly authenticated copies thereof, now in your orator's possession and ready in court to be produced, your orator prays leave to refer.

That your orator marked or caused to be marked, the Paper-Bag Machines embodying the aforesaid patented inventions and improvements or discoveries which have been made, sold or used by
4 your orator or under its authority, by affixing thereon the word "Patented" together with the day and year in which the aforesaid Letters Patent were granted.

That your orator, ever since the date of said Letters Patent has been, and now is the owner of the aforesaid Letters Patent and has been, and now is entitled to all the rights, interests and privileges thereby secured unto it in and to said inventions and improvements or discoveries of the said Letters Patent particularly set forth, and to all damage and profits for the infringements thereof, and is now, and ever since the date of said Letters Patent has been entitled to the exclusive use of the said inventions and improvements or discoveries of the said Letters Patent, within the limits aforesaid.

That the said improvements and inventions or discoveries so patented aforesaid, are of very great utility, and that the same have been extensively introduced into public use, that the public have generally acknowledged and acquiesced in your orator's exclusive rights to the same and in the fact that said Letters Patent are a good and valid patent and that the said William Liddell was the first true and original inventor or discoverer of the inventions and improvements of said Letters Patent and that the said inventions and improvements or discoveries are of great utility.

That your orator has, at all times, stood ready and still stands ready, and is able to supply all public demands for the use of the said inventions and improvements or discoveries of the aforesaid Letters Patent; that your orator has been for several years engaged in manufacturing and introducing to the public machines containing and employing the inventions and improvements or discoveries of the said Letters Patent, and has spent considerable sums of money in such manufacture and introduction;

That the matter in dispute, exceeds, exclusive of interest and costs, the sum or value of two thousand dollars, and is a matter arising under the constitution or laws of the United States.

That the said defendant Continental Paper Bag Company
5 having notice of the aforesaid Letters Patent; and well knowing the premises and rights and privileges secured unto your orator and acting in conjunction and conspiracy with others and contriving to injure your orator and in order to deprive it of the profits, benefits and advantages which might and otherwise would have accrued to it from the said inventions and improvements or discoveries of the said Letters Patent, and without the license or permission of your orator, and against its will and protest, and in violation of its rights in said Letters Patent, has since the 28th day of April, 1896, unlawfully and wrongfully made, sold or used, or caused to be made, sold or used and threatened to continue to make, sell or use within the said District of Maine and elsewhere, paper-bag machines each and all containing, embodying or employing the inventions and improvements or discoveries of said Letters Patent, or substantial or material parts thereof and that the said defendant continues and threatens to make, use or sell the same within the aforesaid District and elsewhere each and all containing, embodying or employing the inventions and improvements or discoveries of said Letters Patent, or substantial or material parts thereof, the exclusive right to which is secured to your orator as hereinbefore set forth, and which said unlawful making, use or sale, by the defendant as aforesaid, is a violation and infringement of your orator's exclusive rights and privileges.

That your orator would, but for the said wrongful acts and doings of the said defendant, and others acting in concert with it have made large gains, profits and advantages from the manufacture, use and sale of the said inventions and improvements or discoveries; and your orator would but for the wrongful acts and doings of the said defendant and others acting in concert with it now be enabled to use the said inventions and improve-

ments or discoveries to which it is entitled to the exclusive right as aforesaid, with profit and advantage, but, that by the said wrongful acts and doings it is now prevented and hindered from so doing.

That the said defendant has derived and received, and is still deriving and receiving, from the aforesaid unlawful and wrongful use great gain and profit, but what amount your orator is ignorant and cannot set forth, but your orator prays that the defendant may be required to make a disclosure of all such gains and profits.

That the defendant, though informed of your orator's rights under the said Letters Patent and of its infringement thereof and requested to desist from such infringement and unlawful use, and to pay to your orator such gains and profits as the defendant has actually made, refuses so to do; by means whereof your orator is and has been greatly and irreparably injured, and is now prevented from putting the said inventions or discoveries into successful operation, and is deprived and prevented from receiving the gains and profits to which it is lawfully entitled from the exclusive rights and privileges so granted and secured to it as aforesaid, and which it would have derived and acquired, and would now derive and acquire, but for the said wrongful acts of the said defendant.

And your orator prays that the said defendant may be compelled, by a decree of this honorable Court, to account for and pay over unto your orator all such gains and profits as have accrued or arisen to, or been earned or received by, the said defendant, and all such gains and profits as your orator would have received but for the said wrongful acts and doings of the said defendant, and all damages your orator has sustained thereby; and that this honorable Court will assess the same, or cause them to be assessed under the direction, and will increase the same, in its discretion, as provided by law.

And that the defendant, Continental Paper Bag Company, its directors, associates, officers, attorneys, solicitors, clerks, servants, agents, workmen and employees may be perpetually enjoined and restrained, by the decree of this Court, from directly or indirectly making or causing to be made, using or causing to be used, or vending to others to be used, in any manner, any paper bag machine containing, embodying or employing the said inventions and improvements or discoveries granted by the said Letters Patent issued as aforesaid, or from infringing upon or violating the said Letters Patent in any way whatsoever.

And that the said defendant, may be decreed to pay the costs, charges and disbursements of this suit; and that your orator may have such other relief as the equity of the case may require, and as to your Honors may seem meet.

To the end, therefore, that the said defendant may, if it can, show why your orator should not have the relief hereby prayed, and may full, true, direct and perfect answer make, but not under oath (an answer under oath being expressly waived) according to

the best of its or its officers', clerks', agents' or workmen's knowledge, remembrance, information and belief, to the several matters hereinbefore averred and set forth, as fully and particularly as if the same were here repeated paragraph by paragraph, and it thereto severally and specifically interrogated, and specifically that it may set forth whether, since the 28th day of April, 1896, it has constructed, made, used or sold, or now continues making, using or selling, or causing or permitting to be made, used or sold, within the District aforesaid, or elsewhere in the United States, any paper bag machine of any kind, containing, embodying or employing the inventions and improvements or discoveries aforesaid, and how many thereof it has so made, constructed, used or sold, or caused or permitted to be made, constructed, used or sold, and when and where constructed, made, used or sold, or caused or permitted to be made, used or sold, and whether it claims so to make, construct, use or sell, or caused to be made, constructed, used or sold, under any pretended, grant or license held by it or by others under the aforesaid Letters Patent.

May it please your Honors to grant to your orator a writ of *subpœna ad respondendum*, issuing out of and under the seal of this honorable Court, directed to the said defendant Continental Paper Bag Company commanding it to be and appear, and make answer unto this bill of complaint, and to perform and abide by such order and decree herein as to this Court may seem required by the principles of equity and good conscience.

May it also please your Honors to grant to your orator a provisional or preliminary injunction issuing out of and under the seal
8 of this honorable Court, enjoining and restraining the defend-nt Continental Paper Bag Company, its directors, associates, officers, attorneys, solicitors, clerks, servants, workmen, employees and agents to the same purport, tenor and effect hereinbefore prayed for, in regard to said perpetual injunction.

And your orator will ever pray, &c.

EASTERN PAPER BAG COMPANY,
[L. S.] By CHAS. F. COBURN, *President.*

BETTS, BETTS, SHEFFIELD & BETTS,
Complainants' Solicitors.

SAML. R. BETTS,
Of Counsel.

UNITED STATES OF AMERICA, *District of Massachusetts, ss:*

On this tenth day of October, 1901, before me came Chas. F. Coburn, to me personally known, who, being by me duly sworn, did depose and say that he is the President of the Eastern Paper Bag Company, the complainant in the foregoing Bill of Complaint, and that he has read the said bill, subscribed by him, and knows the contents thereof, and that the same is true of his own knowledge, except as to matters which are therein stated to be on information and belief, and as to those matters he believes it to be true; that the

reason why this verification is not made by the complainant personally is because it is a corporation.

CHAS. F. COBURN.

Sworn to before me this 10th day of October, 1901.

[L. S.] JAMES E. LEACH,
Notary Public.

9 *Defendant's Answer.*

[Filed December 2, 1901.]

The defendant, for answer to the Bill of Complaint of the complainant, answering, says:

The defendant admits that the complainant is a corporation duly organized and existing under the laws of Connecticut; and that the defendant is a corporation duly organized and existing under the laws of Maine.

The defendant admits that letters patent of the United States No. 558,969, on a paper bag machine, were granted to the complainant, as assignor of William Liddell, April 28, 1896.

The defendant says, on information and belief, that said letters patent No. 558,969 are void for want of invention, in view of the prior art; which prior art includes the following prior letters patent of the United States of America:

No. 242,661, granted to Clarence A. Wolle, June 7, 1881.

No. 327,280, granted to Felix W. Leinbach and Clarence A. Wolle, September 29, 1885.

No. 331,722, granted on the invention of William A. Lorenz and William H. Honiss, December 1, 1885.

No. 333,647, granted on the invention of William A. Lorenz and William H. Honiss, January 5, 1886.

No. 337,964, granted on the invention of William A. Lorenz and William H. Honiss, March 16, 1886.

No. 337,965, granted on the invention of William A. Lorenz and William H. Honiss, March 16, 1886.

No. 337,966, granted on the invention of William A. Lorenz and William H. Honiss, March 16, 1886.

No. 361,951, granted on the invention of William A. Lorenz and William H. Honiss, April 26, 1887.

No. 374,309, granted on the invention of William A. Lorenz and William H. Honiss, December 6, 1887.

No. 374,345, granted on the invention of Edward E. Claussen, December 6, 1887.

10 No. 374,361, granted on the invention of William H. Honiss, December 6, 1887.

No. 377,314, granted on the invention of William A. Lorenz and William H. Honiss, January 31, 1888.

No. 407,794, granted on the invention of Charles B. Stilwell, July 30, 1889.

No. 410,841, granted on the invention of William A. Lorenz and Edward E. Claussen, September 10, 1889.

No. 410,842, granted on the invention of William A. Lorenz and William H. Honiss, September 10, 1889.

No. 418,201, granted on the invention of William A. Lorenz, December 31, 1889.

No. 444,727, granted on the invention of Edward E. Claussen, January 13, 1891.

No. 444,728, granted on the invention of William A. Lorenz January 13, 1891.

No. 444,729, granted on the invention of William A. Lorenz and Edward E. Claussen, January 13, 1891.

No. 459,445, granted on the invention of William A. Lorenz and Edward E. Claussen, September 15, 1891.

No. 517,617, granted on the invention of William A. Lorenz, April 3, 1894.

No. 519,916, granted on the invention of William A. Lorenz and Edward E. Claussen, May 15, 1894.

No. 534,512, granted on the invention of William A. Lorenz and Edward E. Claussen, February 19, 1895.

The defendant does not know whether the complainant ever put into use, anything which is described and claimed in said Liddell patent, No. 558,969.

The defendant does not know whether the complainant, ever since the date of the said Liddell patent, No. 558,969, has been and now is the owner thereof; and the defendant does not know whether the complainant at the time the Bill of Complaint was filed, was entitled to all the rights secured by said letters patent; and the defendant does not know whether the complainant is now the owner of said letters patent, or of any interest therein.

11 The defendant denies, on information and belief, that the alleged inventions which are described and claimed in said Liddell letters patent, No. 558,969, are of very great utility; and likewise denies that they have been extensively introduced into public use; and likewise denies, that the public have generally acknowledged and acquiesced in the complainant's alleged exclusive rights to the same; or in the alleged validity of said patent; or in any claim that any alleged invention covered thereby is of great utility.

The defendant denies, on information and belief, that the complainant has been for many years engaged in manufacturing and introducing to the public, machines containing and employing the alleged inventions claimed by said Liddell patent No. 558,969; and likewise denies that the complainant has spent any considerable sum of money in any such manufacture or introduction.

The defendant positively and emphatically denies that it has made, sold or used, or caused to be made, sold or used, or threatened to make, sell or use, anywhere, any paper-bag machine containing, embodying or employing any invention, improvement or "discovery" which is claimed in said Liddell letters patent, No. 558,969; and likewise denies that it has infringed or prepared or proposed to infringe said letters patent in any way; and likewise denies that it has derived

or received any gain or profit from any infringement of said letters patent.

The defendant says, on information and belief, that the said Liddell Letters Patent, No. 558,969, are void for want of utility because no machine constructed in conformity to said letters patent, can perform any useful function in the manufacture of paper bags, or any other useful function; and because on the contrary, such a machine would spoil whatever material might be delivered to it for that purpose, or for any other purpose; and because no mechanic of ordinary skill in the art of paper bag machinery, could make a paper-bag machine with the aid of the specification and drawing of the said Liddell Letters patent, No. 558,969, and make that machine work usefully. Indeed, the specification and drawing of the said
12 Liddell letters patent No. 558,969, are crude, fragmentary and incomplete to such an extent as to indicate that neither Mr. Liddell nor his attorney, Mr. Hunter, who prepared that specification and that drawing, knew enough about the problem with which they were dealing, to either make a useful paper-bag machine on the general plan of that patent, or to set forth on paper how such a machine could be made.

The defendant says, on information and belief, that the said Liddell letters patent, No. 558,969, are void, because the description of the alleged invention in the specification is not in such full, clear, concise and exact terms as to enable any person skilled in the art to which it appertains, to make and use the same.

The defendant says, on information and belief, that the said Liddell Letters Patent, No. 558,969, are void, because said letters patent contain a needless multiplication of nebulous claims calculated to mislead and deceive the public; and because William Liddell the alleged inventor, did not in said letters patent particularly point out and distinctly claim any part, improvement or combination; and because, though each of the eight claims of said letters patent purports to be for a combination, some of the elements of each of those eight combinations, instead of being particularly pointed out therein, are designated only by words purporting to represent their functions, contrary to Section 4888 of the Revised Statutes of the United States.

The defendant says, that it has heretofore, since April 28, 1896, made and used many paper bag machines in the United States of America, and is still using them in the same country; but that all of those paper-bag machines have been made in substantial conformity to certain letters patent of the United States owned by the defendant; and in making and using those machines, the defendant derived no knowledge or assistance whatever from the said Liddell patent, No. 558,969; and indeed never knew or heard of that patent till shortly before this suit was brought, when it received a letter from the complainant's counsel, mentioning that patent, and requiring the
13 defendant to discontinue its use of its own paper-bag machines on account thereof.

The defendant says, on information, advice and belief, that a court of equity has no jurisdiction to grant any prayer of the Bill of Complaint; even if the said Liddell patent, No. 558,969, were valid; and

even if the defendant's paper-bag machines were to be held to infringe that patent; because the said patent, No. 558,969, is a mere paper proposition which the complainant has never put into effect or use; and because it is contrary to equity to suppress a useful and established business, like that which the defendant is prosecuting with its paper-bag machines, at the request of a complainant which simply owns one paper-bag machine patent, that has never been employed by that complainant in any way in any paper-bag machinery; and because the complainant in this case has a plain, adequate and complete remedy at law for any infringement which may have been done upon said Liddell letters patent, No. 558,969.

All of which statements and defences this defendant is ready to aver, maintain and prove as this honorable Court shal' direct; and it prays hence to be dismissed with its costs in this behalf sustained.

In witness whereof, the said defendant, the Continental Paper Bag Company, has duly executed this answer, and has hereunto affixed its corporate seal, and caused the same to be attested by its secretary.

CONTINENTAL PAPER BAG COMPANY,
[CORPORATE SEAL.] H. ELSAS, *Pres't.*

Attest:
J. KUHE, *Secretary.*

SYMONDS, SNOW, COOK & HUTCHINSON,
Solicitors for the Defendant.
ALBERT H. WALKER,
Defendant's Counsel, Floor 25, Park Row Building, New York.

14 *Replication.*

[Filed January 6, 1902.]

The Replication of the Above Named Complainant to the Answer of the Above Named Respondent.

The repliant, saving and reserving unto itself now, and at all times hereafter, all and all manner of advantage of exception to the manifold insufficiencies of the said answer, for replication thereunto, says, that it will aver and prove its said bill to be true, certain and sufficient in the law, to be answered unto; and that the said answer of the respondent is uncertain, untrue and insufficient to be replied unto by the repliant, without this, that any other matter or thing whatsoever, in the said answer contained, material or effectual in the law, to be replied unto, confessed and avoided, traversed or denied, is true; all which matters and things the repliant is now and will be ready to aver and prove, as this Honorable Court shall direct; and humbly prays, as in and by its said bill it has already prayed.

Dated New York City, January 3d, 1901.

BETTS, BETTS, SHEFFIELD & BETTS,
No. 120 Broadway, New York City, Complainant's Solicitors.

15 *Complainant's Evidence.*

Evidence taken on behalf of the complainant before John A. Shields, Esq., a United States Commissioner for the Southern District of New York, under Rule 67 of the courts of equity of the United States as amended; said evidence being taken at the office of Betts, Betts, Sheffield & Betts, 120 Broadway, Manhattan, New York, beginning on Thursday, March 6, 1902, at 11 o'clock in the forenoon, and continuing thereafter by adjournments from day to day.

Present: The Commissioner and Samuel R. Betts, Counsel for the Complainant, and Albert H. Walker, Counsel for the Defendant.

[*It is hereby stipulated by and between the parties that the complainant's evidence may be taken in this case before John A. Shields, United States Commissioner, with the same effect as if he had been appointed by the Court as Special Examiner to take the said evidence under Rule 67 as amended; and that said evidence may be taken down by a typewriter operator, and when completed and authenticated by Mr. Shields, may be read and used in the case with the same effect as if it had been taken down by Mr. Shields in person.*]

[*And it is also stipulated that at the option of either party testimony and other evidence may be taken in this case in behalf of that party before any notary public (to whom neither party makes special objection), having authority to act as notary public where that testimony or other evidence is being taken before him; and that the evidence may be thus taken with the same effect as if he had been appointed by the Court as Special Examiner to take the said evidence under Rule 67 as amended; and that said evidence may be taken down by any typewriter operator (to whom neither party has any special objection) and when completed and authenticated by the notary public before whom it is taken, may be read and used in the case with the same effect as if it had been taken down by that notary public in person.*]

16 [*It is also stipulated by and between the counsel for the respective parties that printed Patent Office copies of Letters Patent of the United States may be offered in evidence by either party, and used with the same effect as if they were duly certified by the Commissioner of Patents; but such printed Patent Office copies, if found erroneous, may be corrected by proper evidence at any time before the taking of evidence in the case is completed.*]

[*Counsel for complainant offers in evidence the printed Patent Office copy of United States Letters Patent No. 558,969, issued to William Liddell, of Brooklyn, N. Y., assignor to the Eastern Paper Bag Company of Connecticut, the complainant herein, on April 28, 1896, and the same is marked with the title of this cause and the words, "Complainant's Exhibit Liddell Patent in Suit, J. A. S., Exr., March 6, 1902."*]

Adjourned to Tuesday, March 11, 1902, at 11 a. m.

NEW YORK, *March 11th*, 1902.

[*Met pursuant to adjournment.*]

Present: Samuel R. Betts, counsel for complainant.

Albert H. Walker, counsel for defendant.

[*Complainant's counsel offers in evidence a printed Patent Office copy of United States Letters Patent to Edward E. Claussen and George Mortson for paper-bag machines, No. 635,090, dated October 17, 1889, and the same is marked "Complainant's Exhibit, Claussen and Mortson Patent, No. 635,090, J. A. S. Ex'r, March 11th, 1902."*]

[*Complainant's counsel requests defendant's counsel to admit that the Continental Paper Bag Company, defendant herein, is the owner of one undivided half of the entire right, title and ownership in said Claussen and Mortson Letters Patent, No. 635,090, dated October 17th, 1899, and by assignment from Edward E. Claussen, dated November 6, 1899, recorded November 13, 1899, in Liber A-60 page 338 of Assignments of Patents.*]

[*Defendant's counsel declines to make the requested admission.*]

17 [*Complainant's counsel states that he will produce proof in regard to the title of the Claussen and Mortson Patent, No. 635,090, above referred to.*]

[*Complainant's counsel calls the attention of defendant's counsel to the following language used in the defendant's answer filed herein, viz.: "The defendant says that it has heretofore since April 28, 1896, made and used many paper-bag machines in the United States of America, and is still using them in the same country; but that all of those paper-bag machines have been made in substantial conformity to certain letters patent of the United States owned by the defendant." * * * In view of above statement complainant's counsel asks defendant's counsel to admit that defendant herein has used within the District of Maine prior to the filing of the Bill of Complaint herein and subsequent to the issue of the Liddell Patent in suit, paper-bag machines constructed and operated in substantial conformity to United States Letters Patent to Claussen and Mortson, No. 635,090, of October 17, 1899, and above offered in evidence as complainant's Exhibit Claussen and Mortson Patent, No. 635,090.*]

[*Defendant's counsel cannot make the admission requested.*]

[*Complainant's counsel asks defendant's counsel to state whether said Claussen and Mortson Patent, No. 635,090, is one of the "certain Letters Patent of the United States owned by the defendant" in substantial conformity to which have been made paper-bag machines used and still being used within the United States by the defendant as set forth in the paragraph above quoted from defendant's answer.*]

[*Defendant's counsel states that the paper-bag machines which the defendant has used since April 28, 1896, in the United States of America were made in substantial conformity to certain Letters Patent of the United States owned by the defendant, but that those paper-bag machines do not substantially conform to the drawings or to the description of any one Letters Patent of the United States; the fact being that those paper-bag machines were composed*

18 *and made up out of contributions from several different Letters Patent of the United States owned by the defendant; and*

that defendant's counsel declines to state at this time whether said Claussen and Mortson patent, No. 635,090, is one of the Letters Patent from which any contribution was taken to compose and make up any of the said paper-bag machines.]

[Adjourned to Tuesday, March 18th 1902, at 11 o'clock a. m.]

NEW YORK, *March* 18, 1902.

By consent of counsel for both parties, an adjournment was taken until March 21st, 1902, at 11 o'clock a. m.

NEW YORK, *March* 21*st*, 1902.

By consent of counsel for both parties, an adjournment was taken until March 27th, 1902, at 11 o'clock a. m.

NEW YORK, *March* 27*th*, 1902.

By consent of counsel for both parties, an adjournment was taken until April 3rd, 1902, at 11 o'clock a. m.

NEW YORK, *April* 3*rd*, 1902.

[Met pursuant to adjournment.]

Present: S. R. Betts, Esq., and Mr. D. Holden, for the complainant.

[Mr. Holden states in behalf of Mr. Albert H. Walker, counsel for the defendant, that in view of the nature of the evidence which is to be offered Mr. Walker does not consider it necessary for him to be present.]

[Counsel for complainant offers in evidence a certified copy of the abstract of title of United States Letters Patent No. 635,090, October 17, 1899, to Edward E. Claussen and George Mortson, which is marked "Complainant's Exhibit Abstract of Title Claussen & Mortson Patent No. 635,090, J. A. S., Ex'r, April 3, 1902."]

[Complainant's counsel states that this abstract of title is offered in evidence for the purpose of proving that the Continental Paper Bag Company, at the time of the bringing of this suit were the owners of an undivided half interest in this patent; that they obtained

19 *such an interest by an assignment to them from Edward E. Claussen, one of the patentees, and that no assignment of such interest by the Continental Paper Bag Company has been recorded in the Patent Office. The abstract of title contains a great deal of matter relating entirely and exclusively to the undivided half interest in the patent of the other patentee, Mr. George Mortson, which, however, has nothing whatever to do with the point which complainant wishes to prove, and which is contained in the Exhibit offered, merely because the Commissioner of Patents will not certify to an abstract of title of an undivided interest in a patent, or to anything less than the whole interest; that is, the certified abstract must contain digests of all instruments which in any way affect the title of the patent as a whole.]*

[With the object, therefore, of eliminating from consideration matters which are entirely unessential to the point to be proved,

counsel for complainant herewith quotes from this exhibit all of the matter which in any way affects the undivided half interest of Edward E. Claussen in the said patent No. 635,090, said matter being all contained on page 29 of the exhibit offered as follows]:

"29

Claussen and Mortson.

Instrument dated Nov. 6, '99. Recorded Nov. 13, '99. Liber A 60, p. 338.

Parties:

Edward E. Claussen,

to

The Continental Paper Bag Company,

Invention:

Paper Bag Machine.

Oct. 17, 1899. 635,090.

Borough of Manhattan,
City and State of New York:

One undivided half of the entire right, title, interest and ownership in said letters patent. $1 and other considerations."

20 120 Broadway, New York,
Wednesday, *June* 4, 1902.

[*Met pursuant to notice which is hereto annexed with proof of service thereon.*

[*Complainant's counsel offers in evidence the notice of examination above referred to, and the same is marked Complainant's Exhibit, Notice of Taking Testimony on June 4, 1902, J. A. S., Ex'r.*]

Present: Samuel R. Betts, Esq., Counsel for the Complainant.

[*Complainant's counsel states that shortly after 11 A. M. to-day he called up Mr. Albert H. Walker, defendant's counsel, on the telephone at the office of said defendant's counsel, and notified Mr. Walker that he, complainant's counsel, was on the point of starting the taking of complainant's testimony and gave the name of the witness and a brief statement of what he would testify about, and informed Mr. Walker that the direct-examination would take about one hour and the witness would then be presented for cross-examination, but that if more convenient for Mr. Walker the beginning of cross-examination would be fixed for 1:30 P. M. to-day. That as the witness was from out of town, it was necessary to proceed with the testimony.*]

Deposition of Albert E. Lane.

Albert E. Lane, a witness called on the part of complainant, and having been first duly sworn, testifies as follows, in answer to questions by Mr. Betts:

Q. 1. What is your name, age, residence and occupation?

A. Albert E. Lane; age, twenty-eight; residence, Hartford, Connecticut; occupation, machinist.

Q. 2. What has been your experience as a machinist?

A. I was three years at Colt's Patent Fire Arms, Hartford, on the John R. Thomson Printing Press; I worked three years at the Billings & Spencer Co. of Hartford on drop hammers; worked six months at Brown & Sharps at Providence, on milling ma-
21 chines; from there I went up into Maine with the Continental people assembling the Elsas Bag Machines. I was there eleven months.

Q. 3. Exactly when did you go to Maine with the Continental people?

A. I arrived in Maine the 21st of June, 1901, and went to work on the 23rd.

Q. 4. Whereabouts in Maine did you go?

A. A town called Rumford Falls.

Q. 5. Who do you mean by the Continental people?

A. It is the name the company is known by, the Continental Paper Bag Company.

Q. 6. What is there at Rumford Falls where you went to work?

A. The manufacture of paper bags of all descriptions.

Q. 7. Is there a factory there?

A. Yes, sir.

Q. 8. What was here to show that this was a factory of the Continental Paper Bag Company?

A. They had a sign over their entrance.

Q. 9. Anything else?

A. That is all there was to show, just a sign.

Q. 10. State whether you were at Rumford Falls at the factory of the Continental Paper Bag Company continuously from June 21 to October 10, 1901?

A. Yes, sir.

Q. 11. When did you finally leave the employ of the Continental Paper Bag Company?

A. May 10, 1902.

Q. 12. State whether you were with them at Rumford Falls continuously from October 10, 1901, to May 10, 1902, when you left?

A. I was in their employ all the time.

Q. 13. When did you leave their employ?

A. On the completion of a contract for setting up forty-four machines.

Q. 14. Did you have any inducement or job offered you to leave them?

22 A. No, sir.

Q. 15. At the time you left them or before, had any suggestion been made to you that you would be asked to testify in any case?

At this point Mr. Walker, counsel for the defendant, appeared.

A. No, sir; not at all.

Q. 16. Now, during the period from June 23rd to October 10th at the Rumford Falls factory, state just what you had to do and did on paper bag machines?

A. I started to assemble the 6 to 10 pound machines. Except for

a period of two weeks, when I done adjusting on several machines that were running.

Q. 17. What were all the sizes of machines you saw at the Rumford Falls factory up to October 10, 1901?

A. There was only two different sized machines, what they call the 2 to 5 and 6 to 10.

Q. 18. Explain just what is meant by the 2 to 5 pound machines and the 6 to 10 pound machines?

A. The 2 to 5 and the 6 to 10 denotes the different sized bags they make.

Q. 19. Well, what does 2 to 5 mean in bags?

A. Two to 5 means from 2 pound bags to 5 pound bags, it is what their capacity is.

Q. 20. And what does that include?

A. How do you mean?

Q. 21. Well, I mean how many different pound bags does that include as made on the 2 to 5 machine?

A. Two, 3, 4 and 5 pound.

Q. 22. Now in the same way state what 6 to 10 pound machines include in capacity of bags?

A. Six, 7, 8 and 10 pounds.

Q. 23. In this period from June 23 to October 10, what sizes of machines for making paper bags did you see run in any way at the Rumford Falls factory?

A. Two 2 pounds, one three and two 5 pounds.

23 Q. 24. Were any bags being made on these machines in that period, or were they trying to make bags thereon?

A. They were making bags.

Q. 25. What was the bag-making capactiy per hour of these machines as they were run during that period?

A. Well, they would average about from 1,500 to 2,000.

Q. 26. What became of the bags that were made during this period after they left the machines?

A. They were sent to the inspecting bench and inspected and bundled.

Q. 27. Do you know what became of the bundles of bags in respect to their being taken away from the factory or not?

A. I do not.

Q. 28. During this period from June 23rd to October 10th, state how close was your inspection and observation of the machines you saw making bags, and particularly of the parts thereof which fed the blanks and thereafter folded them or formed them?

A. I didn't do much inspecting, my work was to assemble the machines except the two weeks when I was adjusting them.

Q. 29. What I meant was, how much chance during this period did you have to look at the parts of these machines and whether you did look at them sufficiently to now remember them?

A. When I had the machines assembled I had to put the paper on and make bags before it was turned over to A B C Department.

Q. 30. State whether your work on these machines from June 23rd to October 10th made you familiar with the feeding and bag-

forming parts of the machines so that you now remember the construction and operation?

A. The inspection of them made me familiar with the machine.

Q. 31. Please look at a working model now shown you, and state how it compares in construction and operation so far as it shows parts of a machine with the big machines or any of them you saw at the Rumford Falls factory of the Continental Paper Bag
24 Company during the period — June 23rd to October 19th, 1901?

[*Objected to as leading, the witness having made no statement to indicate the character of the machines which he saw, or claims to have seen, and it being therefore leading to ask the witness to look at a particular model and then swear that it agrees or does not agree with some machines which he claims to have seen, but has not attempted to describe.*]

[*Complainant's counsel desires the Examiner to note that the witness now inspects a certain model which complainant's counsel states he will forthwith offer in evidence.*]

A. The shape of the upper frame is similar to the ones in Rumford Falls, the cylinder is very nearly the same and there are other parts that are similar; the movements are the same; some of the cams are of a different shape than those on the Rumford Falls machine. There are parts missing on this model that are on the other machine, for instance, the diamond fingers forming the bottom of the bag are not on the model. That is all I know of at the present time.

[*Complainant's counsel offers in evidence the model just shown the witness, and the same is marked Complainant's Exhibit, Model of Blank Feeding and Diamond Forming Parts of Continental Bag Machine. J. A. S., Ex'r. June 4, 1902.*]

[*The Exhibit is objected to because is has not been proved to truly represent any machinery of the defendant.*]

Q. 32. Now, referring to this model and only those parts which it shows, you stated in your last answer that the "movements are the same" when you compared the model with the Rumford Falls bag machine. Please describe the movements, and state how they are the same?

A. The tube of the bag comes up from a former between what they call the drag rolls and is carried on to the cylinder and the bottom turned over. The tucker plate follows the carrier plate on the cylinder the same as on the Rumford Falls machine. The only difference I see in it is in the shape of some of the cams, but those that are on the model produce the same effect as the other machine.

25 Q. 33. Please explain exactly the difference in the shape of some of the cams and how the same effect is produced by those on the model as those on the Rumford Falls machine?

A. Taking, for instance, the side clip cam; instead of two cams, one on each side of the cylinder, as on the model, there is only one

cam on the Rumford Falls machine, which operates both slide clips. The side nippers are a little bit different in shape, but they turn the proper bottom of a bag.

Q. 34. Now, how is it that the same effect is produced by the cams on the model as by the cams on the Rumford Falls machine although differing as you have described?

[*Objected to because the witness has not described anything.*]

A. Well, I don't know as I can describe the difference. I have seen the model turned over, the cylinder turned over, and the side clips take a hold of the bag the same as the other machines, although the shape of the cam is different.

Q. 35. Does the different shaped cam that you speak of between the model and the Rumford Falls machines result in any different movement or working of the side clips?

[*This question is objected to as calling upon the witness for statements of functions of parts which differ in construction, and as immaterial because the complainant's cannot have any valid patent upon any function of any machinery.*]

A. No, they take a hold and leave go the same as the other at the same time.

Q. 36. Comparing the model with the Rumford Falls machine you have said "the cylinder is very nearly the same." What difference, if any, is there in the cylinders?

A. There is no material difference in them; it is only the Rumford Falls cylinder has been lightened up a good deal more than the one on the model; the parts are trimmed up like to lighten the weight of the machine up.

Q. 37. You have said in your former answer, comparing the model with the Rumford Falls machine "there are other parts that are similar." What other parts do you refer to besides the cylinder and the cams of which you have spoken?

A. The tucker plate is similar, although it is operated
26 different from the Rumford Falls machine. Instead of the tucker plate cam rolls as shown on the model they run on top of the Rumford Falls machine, although it has the same in and out motion of the side nippers.

Q. 38. Please describe more closely the comparative construction and operation of the tucker plate cam rolls on the model as compared with the Rumford Falls machine?

A. Well, I don't know as I am able to explain it to you, but I could show you the difference on the model.

Q. 39. These descriptions have to be taken down in writing for the Court, so I will ask you to look at the model and describe the difference in your own language as you point it out, so it can be taken down by the Examiner?

A. The side nipper cams of the model are similar to those on the Rumford Falls machine; on the Rumford Falls machine there is a bracket that comes out on each side of the frame. Instead of a cam roll, in the side nipper sleeve there is a fork-like bracket on

the Rumford Falls machine with two shoes, instead of a roll as shown on the model, with a cam roll running in the cams on the shaft. That is about all there is.

[*Recess.*]

After Recess.

Q. 40. State whether the difference you mention in your last answer as between the construction of the model and of the Rumford Falls machine results in any different operation or effect of the tucker plate cam roll?

A. No, the operation is the same.

Q. 41. Can you give any reason why brackets were used on the Rumford Falls full sized machine?

A. Well, it is to make more room on the inside of the machine. There is so much internal work in there that they have to get all the room they can.

Q. 42. Now, please operate the model put in evidence by feeding a blank through it and stating successively what happens to the blank as it goes through, describing the work done by each part of the mechanism of the model on the blank and towards forming the bag?

27 A. I took a blank and fed it between the drag rolls. It went up to the conveyor which took hold and passed the blank up on to the cylinder. The front clip takes hold of the end of the blank and the slide clips take hold of the sides of the blank. Immediately after they take hold the side nippers take hold. The carrier drops down and the tucker plate turns over, forming the bottom of the bag, the carrier coming back to its original position again. As the front clip takes hold the hook on the tucker plate takes the upper part of the blank, holding it until the bottom of the bag is turned.

[*Complainant's counsel offers in evidence the blank which the witness has used in the model in connection with giving the last answer to Q. 42, and the same is marked Complainant's Exhibit, Blank formed by Witness, Lane, June 4, 1902, J. A. S., Ex'r.*]

Q. 43. Did you personally operate the model in doing what you described in answer to Q. 42?

A. I did.

Q. 44. How did you operate it?

A. By turning the hand wheel.

Q. 45. Now, comparing the mechanism for feeding and forming blanks in the Rumford Falls machines between June 23rd and October 10, 1901, with the mechanism of the model just operated by you as described in your answer to Q. 42 and the results obtained, state whether or not the successive operations of the mechanism of the model and of the actual Rumford Falls machines on the blanks up to the point the model does its work was different or the same?

[*This question is objected to because the witness has not yet given any intelligible description of the construction or the mode of operation, either of the Rumford Falls machines or of the model in ques-*

tion, and because, therefore, it is incompetent for him to testify whether the construction or the mode of operation of the model is like or unlike the construction and mode of operation of the Rumford Falls Machine.]

A. The result of the work is the same and the operations are the same.

28 Q. 46. You speak in answer to Q. 31 of parts missing on the model that were on the Rumford Falls machine, for instance, the diamond fingers forming the bottom of the bag are not on the model. There is no equivalent on the model for those diamond fingers, is there?

[*Objected to as leading and as also calling for a legal conclusion.*]

Q. 47. What is the next thing that happens to the blanks in the Rumford Falls machine beyond what the model shows?

A. The creasing and ironing, and the pasting at the same time that it creases.

Q. 48. What do the diamond fingers do in the Rumford Falls machine that is done upon the model from which they have been left out?

A. It draws the end of the bag out where it is slit.

Q. 49. And the model does not show that?

A. No, sir.

[*Direct examination closed.*]

[Cross-examination by Mr. WALKER:]

X Q. 50. What motive has influenced you to attempt to disclose the business of your former employer, the Continental Paper Bag Company?

A. No other than I was asked to tell what I knew about the machine, nothing more at all.

X Q. 51. Do you think it quite right for you to accept employment, and after that employment is ended, then disclose your employer's private business or purport to do so to whoever asks for that information?

[*Complainant's Counsel calls attention to the fact that the record shows that defendants were requested to make a statement or stipulation as to the bag machines used by them at the Rumford Falls Factory, and declined to do so, and it is also a fact that every difficulty has been thrown in the way of complainant in making the ordinary and useful proof of construction and operation of alleged infringing machines. It, therefore, comes with bad grace from defendants sued as infringers and endeavoring to escape by*

29 *concealing what they do to criticise the proper bringing of evidence into court in the usual form in such cases for submission of questions of construction, infringement, &c., to the decision of the Court.*]

[*Objected to as utterly immaterial and not proper cross-examination. What the witness thinks has no bearing on the case.*]

A. Well, I have left their employ and entered the employ of other parties and I have a right to if I know anything to their advantage, to help them.

X Q. 52. Is it your opinion that when you leave one employer and enter the employment of some competitor in business, you have a right to give full information to the latter of the private business of the former employer?

[*Objected to as utterly immaterial, entirely incompetent and not relating in any way to the direct, and without any foundation in either fact or testimony. It is not shown that there was anything secret or confidential in the employment of the witness, nor his relations to the Continental Bag Company, nor in the operations of the machines at Rumford Falls.*]

A. Well, there was no private business at all. When I entered their employ there was nothing said about secrecy or anything else.

X Q. 53. Suppose you were to lose your present job, and go looking for another job, would you dare to tell anybody from whom you might seek employment, that you were likely to subsequently get a job with some competitor and then give away to that competitor any information that you might receive in the course of the employment you were seeking; that is to say, would you dare to apply to the Pratt & Whitney Company of Hartford, Conn., for a job as a machinist and tell the Superintendent to whom you make the application, that when you came to leave them, to go to some other machine shop, you would convey to that subsequent employer any information that you might acquire during your employment by the Pratt & Whitney Company?

[*Question objected to as utterly immaterial and incompetent and hypothetical; entirely outside of this case, and any rules applicable to cross-examination or the taking of evidence.*

[*Mr. Walker states to the Court that this line of cross-examination is proper in this particular case, because it relates to the question whether the witness is a man of honor and worthy of belief.*]

[*Complainant's counsel takes exception to the evident attempt to intimidate the witness and further witnesses by such an improper line of questions.*]

[*Complainant's counsel in view of the absolute impropriety of the above question under the rules of evidence, informs the witness that he need not answer the question until the matter is referred to the Court and a judge has ruled thereon and that such question is proper to be answered, and that a proper answer to the question under the instructions would be, I desire this question referred to the Court before answering in view of the above statement of complainant's counsel.*]

A. If I had been asked to withhold my confidence why I shouldn't tell any secrets, but if there had been no agreement entered into I feel that I should further my employer's interests all that I could.

X Q. 54. Did anybody, on behalf of the Continental Paper Bag

Company, ever ask you not to disclose any of the business of that company?

A. No, sir; if they had I should not feel free to come here and give testimony for my present employer, but there was nothing ever said.

X Q. 55. Who are your present employers?

A. That I decline to answer.

[*Complainant's counsel states to the witness that there is no reason why he should not answer that question.*]

X Q. 56. Who are your present employers?

A. Eastern Paper Bag Company.

X Q. 57. How long have you been in the employment of the Eastern Paper Bag Company?

A. This makes the third day.

X Q. 58. When did you begin work for the Eastern Paper Bag Company?

31 A. Last Monday morning.

X Q. 59. For what length of time did you agree to work for the Eastern Paper Bag Company?

A. There was no specified time. I never sign any contract with anybody for any specified time.

X Q. 60. Did that contract cover anything in addition to giving your deposition in this case?

A. There was no contract made at all; they simply engaged my services, whatever they might be.

X Q. 61. You perhaps do not realize that a contract may be made by word of mouth without any writing, so that whenever you agree with any person to work for him, that constitutes a contract?

A. Well, there was no definite time stated or asked; until one or the other sees fit to get through or be discharged.

X Q. 62. When you made this engagement to serve the Eastern Paper Bag Company for some indefinite time, what was said as to the nature of the service you were to render?

A. I did not know anything about the service. I was engaged to report in New York. I was engaged in Hartford.

X Q. 63. And this engagement occurred last Monday?

A. I was engaged last Saturday, but it was to commence Monday morning.

X Q. 64. For whom were you working last week?

A. I was not working at all last week. I have been disengaged since I left the Continental Paper Bag Company.

X Q. 65. Have you been idle all the time since October 10, 1901, till May 31, 1902?

A. No, sir; I was employed by the Continental Paper Bag Company until May 10th.

X Q. 66. Were you idle in Hartford from May 10th to May 31st, 1902?

A. Yes, sir.

X Q. 67. Who was it that employed you last Saturday, May 31, 1902, to work for the Eastern Paper Bag Company, and to begin

work on Monday, June 2nd, by reporting to somebody in New York?

32 A. Mr. Fenn, of the Fenn-Sadler Company of Hartford.

X Q. 68. Whom did Mr. Fenn represent, as you understood?

A. He didn't tell me. He simply engaged me to report to New York.

X Q. 69. To whom did he engage you to report?

A. Mr. Samuel R. Betts, 120 Broadway.

X Q. 70. When did you first learn that it was the Eastern Paper Bag Company that was engaging you through Mr. Fenn?

A. When I arrived in New York.

X Q. 71. What compensation was promised you for your services to the Eastern Paper Bag Company?

A. My pay was to be $5 a day and expenses.

X Q. 72. How long were you given to understand your services would be wanted?

A. I wasn't given any time; there was no time set for it at all.

X Q. 73. Was any money given to you by Mr. Fenn for your expenses to New York?

A. No, sir.

X Q. 74. How did Mr. Fenn or Mr. Betts or the Eastern Paper Bag Company learn that you had worked for the Continental Paper Bag Company at Rumford Falls?

A. That I can't say; I don't know; they sent for me and I came.

X Q. 75. What wages were paid to you by the Continental Paper Bag Company?

A. $3.25 a day.

X Q. 76. Did you ever have any higher wages than that before you accepted employment with the Eastern Paper Bag Company?

A. Not for a day of ten hours, but when I worked for the Continental Paper Bag Company I often earned $4.75 a day. I got time and a half for over time and I worked four nights in a week.

X Q. 77. Did you have anything to do with making the model marked Complainant's Exhibit Model of Blank Feeding

33 and Diamond Forming Parts of Continental Paper Bag Machine?

A. No, sir.

X Q. 78. When did you first see that model?

A. Yesterday.

X Q. Where did you first see it?

A. In the same place where it is located now in this office.

X Q. 80. When did you last see one of the Rumford Falls machines?

A. May 10th.

X Q. 81. May 10th was more than three weeks ago, is it not?

A. Three weeks and two or three days—less than four.

X Q. 82. How much time did you spend examining the exhibit after Mr. Betts put Q. 31 to you and before you answered that question?

A. Only two or three minutes, maybe five.

X Q. 83. Refresh your recollection on this point, and state whether I am not right in saying that the time was less than half a minute?

A. Well, it might have been; I didn't take note of the time but it must have been more than half a minute.

X Q. 84. How much time have you spent examining that exhibit altogether, up to this moment?

A. It wouldn't be over half an hour.

X Q. 85. There are a good many differences, are there not, between the complainant's Exhibit Model of Blank Feeding and Diamond Forming Parts of Paper Bag Machine and the machines of that company which you saw in Rumford Falls?

A. There is not any difference in the result, some of the cams are shaped different, some of the working parts are shaped different, but the result is the same.

X Q. 86. Is it your testimony on this subject that the exhibit is adapted to produce the same result as certain parts of the Rumford Falls machines, but that the mechanism for producing that result is different in some respects, while similar in some other respects?

A. It is.

34 X Q. 87. Are you a draughtsman?

A. No, sir.

X Q. 88. Would it be possible for you to sit down at a table and make a set of drawings that should conform in all respects to those Rumford Falls machines so that by examining those drawings a man who was both a draughtsman and a machinist would understand exactly how those Rumford Falls machines are constructed?

A. No, sir.

X Q. 89. Would it be possible for you to convey that information in writing?

A. I don't think it would.

X Q. 90. Would it be possible for you to convey that information in writing and in drawing assisted by the exhibit, about which you have been testifying, so that a skilled machinist and draughtsman would have the exhibit to go by and would have your drawings to go by and would have your written description to go by?

A. I wouldn't have no drawings to go by, for I am not a draughtsman and could not make the drawings.

X Q. 91. It is a fact, is it not, that there is only one way in which you can show anybody the differences between the Rumford Falls machines and the Complainant's Exhibit, and that that way would consist in having one of the Rumford Falls machines and the exhibit in the same room and explaining to the person to whom you were giving information the differences between the two?

A. Well, I could give a general idea with a model. I couldn't give you all the angles and measurements without the Rumford Falls machines or the drawings.

X Q. 92. A general idea is not what I am inquiring for. What I want to know is whether you could show anybody how to build a paper bag machine like one of the Rumford Falls machines with-

out having one of those machines to show to the party whom you were trying to teach?

A. I could if I had the drawings. I couldn't without it.

35 X Q. 93. What drawings do you refer to in your last answer?

A. The entire set of drawings of the machine at Rumford Falls.

X Q. 94. Did you work as a machinist to make any part of either of those machines at Rumford Falls?

A. I did.

X Q. 95. What parts did you make, or help to make?

A. Well, there are too many parts to mention that I made there, gears and cam blanks, shafts.

X Q. 96. In your direct-examination, you stated that just what you had to do and did on those paper-bag machines was to assemble them, except for during two weeks when you did adjusting on several machines that were already running. Now, how is that testimony consistent with your present statement that you, yourself, made, or helped to make many of the parts of the machines?

A. It was my duty as assembler to make the parts if they were broke or missing or couldn't be found when they were ready to assemble.

X Q. 97. It is true, is it not, that the Continental Paper Bag Company never made any paper bag machines in Rumford Falls, but that the machines used there were all made in other places?

A. All the square bottom bag machines were made in other places, all the other machines I do not know anything about.

X Q. 98. It is true, is it not, that the square bottom bag machines of the Continental Paper Bag Company were all made outside of the State of Maine, and were tested where they were made before they were shipped to Maine at all?

A. They were all made outside of the State, but whether they were tested or not, I don't know anything about that; they all had to be rebuilt.

X Q. 99. When they arrived at the factory in Rumford Falls were they set up ready to run, or did the separate parts come disconnected with each other?

36 A. The 2 to 10 pound machines were all set up, but were all torn down and overhauled.

X Q. 100. Why were they taken apart at the factory in Rumford Falls?

A. Because they did not operate as they should.

X Q. 101. Who gave the directions and took the responsibility of making them run correctly?

A. Mr. C. A. Widmer.

X Q. 102. Now, precisely what did you do with your brain or with your hands on any of those machines in Rumford Falls?

A. Well, I helped take some of the machines down and make new parts, some of the cams I recut and placed them back on the machine again and adjusted it until they made what they called a perfect bag.

X Q. 103. Did anybody ever consult you about any plan for

building or changing those machines; or did you simply work there in the Rumford Falls factory as a machinist to do whatever detailed thing you were directed to do?

A. All the draughting was done in the office. I was there to do what the drawings called for and what the foreman told me.

X Q. 104. Do you know enough about those Rumford Falls machines to show anybody how they are constructed without any assistance from the machines themselves and without any assistance from the drawings of the Continental Paper Bag Company from which those machines were built?

A. No, sir.

X Q. 105. Has anything been said to you about applying to the Woodward & Rogers Company in Hartford for a job?

A. No, sir.

X Q. 106. Or about doing anything else to inform yourself of the business of that company?

A. No, sir.

X Q. 107. Now, suppose the Eastern Paper Bag Company in pursuance of its employment of you should direct you to go to Hartford and try to get a job with the Woodward & Rogers Company, and after getting into their factory, try to find out the character of any machinery being built in that factory, and afterwards go on the stand and testify against the Woodward & Rodgers Company in respect of machinery made in their factory; would you undertake that scheme and try to carry it out?

37

[*Objected to as immaterial, hypothetical and incompetent, entirely outside any matter in the direct-examination or in the case.*]

A. No, sir.

X Q. 108. Why not?

[*Same objection.*]

A. I am not hired for a spy.

X Q. 109. What is the moral difference between hiring yourself out beforehand to be a spy; and hiring yourself out afterward to tell what spying you have done already; and what is the moral difference between trying to betray your employer's business after you have found that business out and trying to induce a new employer to inform you of his business for the purpose of betraying it?

[*Objected to as immaterial, incompetent and entirely outside the case. This is a patent case, not the examination of a candidate for the ministry.*]

A. I don't know as there is any moral difference. But the way I look at it, I have a right to give any information that I may gather while in the employ of any person if there be no restrictions placed on me. If I was hired to go out and get the information, that is another thing.

X Q. 110. It is a fact, is it not, that you would prefer not to have disclosed any information which you obtained while in the employ-

ment of the Continental Paper Bag Company, but that you have undertaken to do so from no other motive than $5 a day and your expenses at a time when you were out of a job?

A. I don't know as it is a matter of preferment. I could have gone to work as soon as I left the employ of the Paper Bag Company, but I wasn't looking for a position at the time. These parties sent after me and asked me to enter their employ.

X Q. 111. Would you have come down to New York this week and give this deposition for $1.50 a day and your expenses?

38 A. Certainly not.

[*Cross-examination closed.*]

Redirect examination by Mr. BETTS:

R. D. Q. 112. Referring to the parts of the machine for feeding in and forming the blanks as shown in the model referred to, is, or is not, your recollection clear and distinct as to the construction and operation of the corresponding parts in the Rumford Falls machines during the period from June 23rd to October 10th, 1901?

[*Question objected to as leading for several reasons, including the fact that it does not appear that there were any corresponding parts in the Rumford Falls machine, and the question is objected to as immaterial because it does appear that the witness is not competent to convey to others the knowledge of the construction of the Rumford Falls machines even if he has that knowledge himself.*]

[*Complainant's counsel criticises the last clause of the objection as a mere conclusion stated by defendant's counsel.*]

A. The principle and the feed are the same, but some of the parts are of a different shape.

[*The answer is objected to because it involves a conclusion of law.*]

R. D. Q. 113. You have not quite answered my question which was whether you remembered what was the construction and operation of these feeding and folding parts in the Rumford Falls machines you worked on between June 23rd and October 10th, 1901?

A. Yes, I remember what the construction was of the Rumford Falls machines.

R. D. Q. 114. Then it is your lack of skill as a draughtsman that you refer to when you say you could not sit down at a table and make a set of drawings conforming in all respects to the Humford Falls machine, is that so?

A. It is.

R. D. Q. 115. Do you know in what places were made the machines that you saw at the factory of the Continental Paper Bag Company in Rumford Falls for making square bottom bags?

39 A. They were made in Elkhart, Indiana.

[*Re-direct examination closed.*]

[*Deposition closed.*]

[*Adjourned to Monday, June 9, 1902, 2 p. m.*]

NEW YORK, *June* 9, 1902.

[*Met pursuant to adjournment.*]
Present: Counsel as before.

Deposition of Melville E. Dayton.

MELVILLE E. DAYTON, a witness called on the part of complainant, and having been first duly sworn, testifies as follows, in answer to questions by Mr. Betts:

Q. 1. What is your name, age, residence and occupation?

A. Melville E. Dayton; age, upwards of sixty years; residence, Washington, D. C.; occupation, mechanical expert.

Q. 2. Please state what has been your general mechanical and scientific education and experience and your special experience in connection with letters patent and giving opinions and testimony in relation thereto?

A. First, I have testified as a mechanical expert many times each year during the last twenty-five years in suits brought for the infringement of letters patent; secondly, I have, for thirty years past been engaged in the business of preparing drawings and specifications for applications for letters patent and in the prosecution of such applications in the United States Patent Office and in the Patent-Granting Departments of government in other countries. These occupations have involved the careful analysis of machines and inventions and the close comparison of machines with each other and with the descriptions and claims of letters patent. I was equipped for this work by a natural aptitude for mechanics; by an early training among mechanics and machines; by learning the machinist's trade; by the study of theoretic mechanics and by the study and practice of mechanical drafting. I have made several mechanical inventions some of which have been patented and have proved of practical and money value. The number of applications for patents which I have prepared and prosecuted exceeds two thousand, relating to a great number of mechanical subjects, and the machines involved in the hundreds of suits in which I have testified as a mechanical expert have been widely various, all which experience has been calculated to give me a ready and reliable understanding of machines and patents therefor.

Q. 3. Please look at U. S. Letters Patent to William Liddell No. 558,969, dated April 28, 1896, for paper bag machine; state whether you are familiar with or understand the same, and state what you find to be the invention covered by said letters patent and more particularly covered in the first, second and seventh claims thereof?

A. The general subject of the Liddell patent referred to in the question is a machine for performing certain operations in the manufacture of square-bottomed paper bags. In order to define more clearly the particular operation to which the machine of the Liddell patent relates, I point out that such paper bags are formed from tubular blanks, the sides of which tubes are longitudinally tucked or folded inward. Blanks in this form are delivered to ma-

chinery which first opens out an end of the tube into what is called the "diamond." The ends of the diamond are afterwards folded over and pasted to complete the square bottom. The Liddell patent is mainly concerned with the operation of forming the "diamond."

The diamond-forming machine of the Liddell patent is distinctively a "rotary-bed" machine. That is to say, the bed upon which the tubular blank is fed and upon which the diamond thereof is formed presents a surface for the support of the blank which is continuously advancing about an axis, in contradistinction to a bed which reciprocates. The rotary bed of the Liddell patent is a wide faced cylinder, seen at C in Figs. 1, 2, 3 and 4. The loosely flattened blanks are fed into the machine by feed-rollers DD,

41 seen in Fig. 1, after passing which feed-rolls the tucked blank resumes its normally open condition indicated in Fig. 12 and also indicated by dotted lines in Fig. 3 and generally by Fig. 5. The cylinder C is provided with a central, automatically acting clip *c*, shown best in Figs. 3 and 4, which clip at the proper moment is thrown down upon the advanced end of the lower fold only of the partially open tube, so that the tube or blank, after being so seized by the clip, is drawn along with the cylinder surface.

In order to form the "diamond" while the rotary bed or cylinder is advancing, the upper fold of the tubular blank must be lifted and thrown back towards and over the body of the blank. For the purpose of effecting this, a tucker-plate or so-called "forming-plate" E is employed having a margin W reduced to a rather thin edge. This edge W of the forming-plate is at the proper time depressed upon the blank and will ordinarily press the blank closely against the cylinder along the line of said edge W. Thereafter the edge W must advance uniformly with the cylinder and, at the same time, the forming-plate must turn over upon said edge W thereof as an axis. The forming-plate being provided with means for carrying the upper fold of the bag blank over with it, the edge W of the plate creases the upper fold of the blank, or, in other words, defines a line in the upper fold of the blank about which said fold is turned backwardly upon the blank as the latter advances with the cylinder surfaces.

For the purpose of lifting and carrying the upper fold of the blank with it, the forming-plate E is provided with fingers HH. Figs. 2, 3 and 4 and also, seen in part, in Figs. 5, 6, 7 and 8. Said fingers H are pivoted to the forming plate, on the under-side of the latter (as said plate stands before being turned backward) and outside the path of the blank, and said fingers are vibrated into the side tucks of the blank to a position where their edges stand at an angle of forty-five degrees to the creasing edge W of said plate, and in proper place to define the lines over which the material in the blank entering into the tuck thereof is to be folded in this operation of forming the diamond.

42 An additional means for carrying the upper fold of the paper back with the forming-plate is seen in the hook E′, clearly shown in Figs. 3 and 4, and also in the diagrammatic figures 5, 6, 7 and 8. This hook or finger E′ is on the folding-plate prop-

erty remote from the creasing edge W, being shown in the drawings of the Liddell patent, Figs. 3 and 4, as being at the opposite or rear edge of said folding-plate. In the insertion of the tubular blank into the machine this finger E′ enters the end of the blank and is position to engage the upper fold of said blank while the clip *c* holds the subjacent central portion of the lower fold of the blank. With the fingers or nippers HH holding the margins of the upper fold of the blank against the forming-plate and with the finger or clip E′ holding the end of the upper fold of the blank, said forming-plate, in its oscillation upon the creasing edge W as its axis, carries the upper fold of the blank with it as far as the forming-plate goes in this direction.

The cylinder C is provided with fingers G which, in the receiving position of the forming-plate shown in Figs. 3 and 4, are directly beneath the fingers H belonging to said forming-plate, and said fingers G swing inwardly into the tucks in the sides of the tucked blank in a manner and to a position corresponding with the fingers H. Said fingers G, therefore, hold the lower fold of the blank to the cylinder as the fingers H hold the upper fold to the forming-plate, and said fingers G also define the folds of the triangle in the lower members of the tucks as the fingers H define them in the upper members.

I have so far said nothing as to how the forming-plate E is oscillated backwardly upon the creasing edge W, and now explain that, for this purpose, said forming-plate is provided with a supporting axis *e* outside and independent of the rotating bed. In the particular construction shown in the Liddell patent said supporting axis *e* is in the ends of two vibratory arms F, which arms are raised as the creasing edge W of the forming-plate presses and advances with the surface of the cylinder C until the form-
43 ing-plate reaches a position radial to the cylinder, and then, as the creasing edge still further advances with the cylinder, the supporting arms F F move inwardly to permit said creasing edge to follow along with the cylinder at its single proper line of pressure against the latter. This will be seen to be a necessity where the forming-plate E has a substantial external axis or point of support. That is to say, it is necessary either that the external supporting axis *e* shall recede from and approach the rotary bed or that the rotary bed shall recede from and approach the axis *e*, and Liddell has chosen to illustrate and describe a construction giving actual movement to the axis *e*, instead of actual movement of the bed in securing this necessary relative movement of the two parts.

The actual movement outwardly or upwardly of the axis *e*, or in other words, the raising of the supporting arms F carrying the axis *e*, is effected positively through the medium of an arm F′, connected to the shaft on which the arms F vibrate, and a cam K′ on the shaft L (Fig. 1) from which shaft L the machine is driven. Such compensatory variation of the movements of the arms F and such swing of the plate E as are necessary to keep the creasing edge W of the forming-plate E in bearing upon a constant

line of the blank are provided for by the gear wheel N (rigid with the axial shaft *e*), intermediate gears MM, the rack-wheel M′, a cam K and connections between the cam K and the rack-wheel M′ by which cam said rack-wheel is rocked appropriately upon its shaft *f*, during the vibrations of the arms F F that accompany the folding operation of the forming-plate E. Springs F′ are so arranged as to pull the arms F F downward or inward in opposition to the cam K′.

Recurring to the fingers or nippers H H and G G, vibratorily mounted on the forming plate E and cylinder C, respectively, as already described, I point out that said fingers are normally held retracted outside the path of the bag blank by springs of which one is shown at J in Fig. 2, the two fingers H H being connected so as to be simultaneously thrown inward or outward by the rod H′, Fig. 2, connected with arms *h h* projecting from the hubs of said fingers. The same connection between the fingers G G,
44 shown at G′, Figs. 3 and 4, insures their simultaneous movement. The fingers are thrown inward into the tucks of the bag blank by cams, a cam I, Fig. 2 and Fig. 1, serving to throw in the forming-plate fingers H H, and a cam I′ serving to throw in the cylinder fingers G G. Said cams act upon the fingers through the medium of projections on the finger structures of which one is shown in Fig. 2 and H2.

Fig. 3 shows the position of the forming-plate E for the reception of the bag blank beneath it, said figure showing the blank as having been seized at the extremity of its lower fold by the central cylinder clip *c* and drawn to a position where the upper fold of the blank (shown by dotted lines) has passed over the finger E′ at the right hand margin of the former-plate. The fingers H and G, belonging respectively to the forming-plate and cylinder, are now about to enter the tucks of the blank. Fig. 4 shows the fingers H and G swung into the tucks and the forming-plate depressed at its creasing edge W upon the blank and against the cylinder and partly oscillated by the lifting of the arms F F connected with the forming-plate at a distance from said creased edge W. The diagrammatic Figures 5, 6, 7 and 8 show the positions of the forming-plate E and of the fingers H and G at four steps in the diamond-forming movement of said forming-plate E. These figures also show the office and action of the finger E′ on the forming-plate. In connection with these Figures of the drawing it will be seen that the nipper fingers H and G are promptly thrown into their proper inclined positions early in the operation, and that they retain these positions until the diamond is completed, as shown in Fig. 8.

To insure the proper elevation of the free creasing edge of the forming-plate E for the reception of the end of the bag blank beneath it, said forming-plate is shown in Figs. 2, 3 and 4 as being provided with eyes E2 which, in the retraction of the forming-plate to its receiving position, pass over studs or projections A′ permanently attached to the frame A. The forming-plate E is brought back to its receiving position after forming a diamond by a second

rise and descent of the arms F and by the action of the gears N MM and M′ and the cam K.

After the foregoing description of the machines, so far as
45 concerned in the claims referred to in the question, the following statement, taken from the patent, giving broadly the in- readily understood. The statement begins at the middle of line *readily understood. The statement begins at the middle of line* 17, of page 1:

"My improvement, briefly stated, may be described as follows: The tube is received upon the revolving cylinder and carried forward by a nipper, which clamps the lower sheet of the tube, or by other means hereinafter described. The upper sheet of the tube passes above a finger upon a moveable forming-plate securely held at a short distance from the revolving cylinder and between which and the cylinder the tube is guided. The forming plate is then caused to rotate about its rear edge simultaneously with its movement or travel with the revolving cylinder, thereby opening the end of the tube, spreading the side folds, and marking a creased line transversely. Simultaneously with this forming fingers are projected into the side folds, one pair being adapted to the cylinder and the other pair to the forming-plate. A continued moving of the parts causes the upper layer or sheet of the tube to be completely turned backward upon itself, and at the same time the forming-fingers together with the other parts insure the proper formation of the diamond fold."

The specification goes on to say that, "The tube in this shape "leaves the revolving cylinder, passes to the pasting devices and "thence to the folder;" but the pasting and folding devices here referred to need not be described nor considered since they form no part of the subject matter of any of the claims here in controversy. It is only necessary to mention that the "other means" referred to near the beginning of the above quotation, for carrying forward the bag blank or tube with the cylinder, in place of the nipper there mentioned, is a pair of rollers seen at S in Fig. 1
46 and marked S′ in Fig. 9, which rolls will draw along a number of connected blanks. The nippers *c* will be used in handling blanks which are completely severed from each other, but for the utilization of the drag-rolls S or S′ instead of the nippers the blanks are left connected by a narrow central neck of paper, so that one can be drawn after another, or a continued series of blanks may be drawn, along the cylinder by said drag rolls.

[*Adjourned to Tuesday, June 10, 1902, at 11 a. m.*]

NEW YORK, *June* 10, 1902.

[*Met pursuant to adjournment.*]

Present: Counsel as before.

MELVILLE E. DAYTON *resumes.*

Direct examination continued by Mr. BETTS:

[*Answer to Q. 3 continued:*]

This matter is referred to at line 28 of page 2 to line 13 of page 3 of the specification, the statement here given concluding with the following sentence: "It will thus be seen that it is not necessary "to employ the nippers [*c*] upon the cylinder C, though it may "be more desirable to use them." The use of the word "nippers" in the plural here and elsewhere in the patent has reference to the allowability of making the cylinder large enough to permit more than one detached blank to be opened up into the diamond form in a single revolution of the cylinder, as many nippers being supplied at different points in the circumference of the cylinder as blanks are to be formed in one turn thereof.

As indicating the intention of the patentee to cover the invention very broadly and without dependence upon mere details of construction, I further quote as follows. At page 3, line 14, the specification says, with respect to the entire machine thereinbefore described,

"It is evident that the mere mechanism for securing the several movements to the different parts may be modified or changed
47 in various ways without departing from the spirit of the invention, and I do not, therefore, confine myself to the details of construction here shown."

Similar comments are made concerning some of the parts earlier in the specification and in immediate connection with the descriptions of said parts. For example, at page 2, line 6, after a description of the particular devices shown for the operation of the forming-plate E, the patent says:

"In place of these devices for controlling the movement of the plate E relatively to the cylinder C the said plate may be moved or operated *by any other suitable means.* The [means for providing the] return movement of the plate E is unimportant, so long as it is secured in time to receive a new bag-tube or section thereof."

The patent does not pretend to give the exact form of the various cams shown, necessary to the exact operation or movement required in the parts controlled by them, this being left to the constructor under the general rule, but sometimes by express statements like the following, found at page 2, line 120:

"The movement of the arm F is governed by the cam K' and arm F', and *is so timed* that while permitting the rotation or oscillation of the plate E about its axis *e* it insures the edge W moving exactly at the same speed of the cylinder C, so as not to displace in any manner the tube."

This last quotation leads me to state that the specification of this Liddell patent is not in all respects faultless. For example, in

this quoted statement and elsewhere throughout the patent, the specification speaks of "the arm F" in the singular number, while in fact the drawings of the patent show two arms F (see Fig. 2) one at each end or side of the forming-plate E. Of course such errors of statement are immaterial to an understanding of the actual
48 construction and of the invention. Another instance of careless statement is found on page 2, between lines 54 and 68. Here reference is made to the timing of the movements of the fingers G and H which, as before explained, are thrown into the side tucks of the blank preparatory to the backward oscillation of the forming-plate E in making the diamond. The intimation of the statement concerning this matter of timing is that the edge W of the forming-plate is pressed down upon the blanks and is made to press the blank against the cylinder as or before the side fingers G and H begin their inward movement into the side tucks or folds of the blank. The edge W of the former-plate may begin its descent before said fingers G and H move inward, but, if said fingers be made of the length they are indicated to have in Fig. 3, the edge W of the former-plate must not completely press the tube against the cylinder before any inward movement of said fingers takes place, because, in that case, the fingers are too long to enter at all. The length of these fingers is not prescribed in the patent and they may be shortened to permit the exact order of movement which appears to be stated at this part of the specification. On the other hand, said fingers, without being shortened, may be made to enter properly into the tucks provided their inward movement is timed to begin before the edge W of the forming-plate has so far descended as to stand in their way. This also is a matter of no material importance since the constructor will naturally adjust the timing of the movements of the parts appropriately for their clearly stated operation, or will proportion the fingers to the conditions under which they are to enter the tucks. Such modifications as would here be required are clearly covered, it appears to me, in the concluding paragraph of the specification already quoted from lines 14 to 20, page 3, and which I again quote as follows:

"It is evident that the mere mechanism *for securing the several movements to the different parts may be modified or changed* in various ways without departing from the spirit of the invention, and I do not, therefore, confine myself to the details of construction here shown."

49 The claims referred to in the question read as follows:

"1. In a paper bag machine, the combination of a rotating cylinder provided with one or more pairs of side-folding fingers adapted to be moved toward or from each other, a forming-plate also provided with side-forming fingers adapted to be moved toward or from each other, means for operating said fingers at definite times during the formative action upon the bag-tube, operating means for the forming-plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder, the whole operating for the purpose of opening and forming the bottom of the bag-tube, and means to move the bag-tube with the cylinder.

"2. In a paper-bag machine, the combination of the rotating cylinder provided with one or more pairs of side-folding fingers adapted to be moved towards or from each other, a forming-plate also provided with side-forming fingers adapted to be moved toward or from each other, means for operating said fingers at definite times during the formative action upon the bag-tube, operating means for the forming-plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder for the purpose of opening and forming the bottom of the bag-tube, a finger moving with the forming-plate for receiving the upper sheet of the tube and lifting it during the formative action, power devices for returning the forming-plate to its original position to receive the new bag-tube, and means to move the bag-tube with the cylinder.

"7. In a paper-bag machine, the combination of the rotating cylinder for the bag-tube provided with one or more pairs of folding-fingers adapted to be moved towards or from each other, a forming-plate also provided with forming-fingers adapted to be moved towards or from each other by means for operating said fingers at definite times during the formative action upon bag-tube, operating means for the forming-plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder for the purpose of opening and forming the bottom of the bag-tube, and connecting mechanism for timing the movement of the rotating cylinder and the forming-plate."

It will be observed that claim 2 differs from claim 1 in that it contains two elements not mentioned in said claim 1: These are (1) "a "finger moving with the forming-plate for receiving the upper sheet "of the tube and lifting it during the formative action," represented at E′ in Figs. 3, 4, 5, 6, 7 and 8, and (2) "power devices for return-"ing the forming-plate to its original position to receive a new bag-"tube." Where the claims say of the cylinder that it is "provided "with one or more pairs of side-folding fingers," reference is had to the fact that the cylinder may be made large enough to take more than one blank in one revolution, one pair of side-folding fingers being called for for each blank.

Claim 7 differs from claim 1 in omitting the last element named in claim 1, to wit, "means to move the bag-tube with the cylinder," and calling for "connecting mechanism for timing the movements of the "rotating cylinder and the forming-plate."

[*Recess.*]

After Recess.

Q. 4. You have referred in your last answer to the forming-plate of the Liddell patent as being turned *backward*, in the operation of the machine and also to said forming-plate as defining a line in the upper fold of the blank about which said fold is turned *backwardly* upon the blank as the latter advances with the cylinder. Please state exactly what the movements are in the Liddell patent mechanism,

which you have included under these words "backward" and "backwardly"?

51 A. As to the forming-plate, the movement which I have called a "backward" movement is, in fact, only relatively backward. That is to say, it is a backward movement relative to the forward motion of the cylinder surface. This so-called backward movement of the forming-plate is accomplished solely by the forward movement of the inner free edge W of said forming-plate, the opposite edge of the forming-plate having no backward and forward movement whatever, but solely the outward and inward movement with respect to the cylinder due to its attachment to the vibratory arms F F. The movement of the creasing edge W of the forming-plate E forwardly with the cylinder is produced by the gear wheels N M M as actuated by the engagement of the last one of these with the comparatively stationary rack-wheel M', during the swing of the arm F F as produced by the cam K'. A compensating variation in the speed of the edge W of the plate that would be produced by these gears is effected by the cam K which operates to give a desired rocking movement of the rack-wheel M', as a result of which the edge W of the plate E preserve its position on the cylinder during its advance with said cylinder. The statement of the patent concerning this matter is found in the paragraphs beginning with line 89 of page 1 and ending with line 13 of page 2, a portion of which paragraphs I quote as follows:

"L is a rotating power-shaft carying cam [K'] and is driven by a belt-pulley L' and operates the cylinder C by gears M^2 M^3. Spur-gearrs M' M N operates the axis *e* of the forming-plate E when the arm F is moved. Of these gears M' is substantially fixed, and hence when the arm F is moved its gears M work upon gear M' as if it were a rack. This causes motion of the plate E about *e* as an axis.

"As the motion of the arm F is irregular and not always in the same direction for one continuous movement of the former-plate E, I cause the gear M' to be moved somewhat to compensate for this. On the shaft L, I arrange a cam K, which acts upon a rod *k* to reciprocate it [the rod] and this by link k^2 rocks the gear or rack M'.

52 The cams K and K' insure a proper return movement of the arm F and former-plate E and in time with the rotations of the cylinder C * * *"

My use of the word "backward" in connection with the fold of the upper sheet or layer of the tube in forming the diamond is strictly correct in relation to the body of the bag-tube, but there is no actual backward movement of this portion of the bag-tube. On the other hand, the upper portion or sheet of the bag-tube has an actual forward movement, but a less rapid forward movement than has the body of the bag-tube which travels at the same speed with the cylinder. The result is the backward folding of the upper portion of the advanced end-of the bag-tube upon the body of the bag-tube, in forming the diamond.

Q. 5. State whether you have read and understand the testimony given in this case by Albert E. Lane, a witness called on the part of complainant?

A. I have, and do.

Q. 6. State whether you have examined and understand the model referred to in that testimony and offered in evidence as "Complainant's Exhibit Model of Blank-Feeding and Diamond-Forming Parts of Continental Bag Machine"?

A. I have, and do.

Q. 7. State your understanding, as derived from such testimony and said model, of what were the blank-feeding and diamond-forming parts of machines for making paper bags used at the Rumford Falls, Maine, factory of the Continental Paper Bag Company, prior to October 10, 1901, and referred to in the testimony of said Lane. In this connection, refer to certain mechanical differences stated by said Lane as between the model and the actual Rumford Falls mechanism, and state their bearing, if any, on construction and operation?

[*Mr. Walker objects to this question because it calls for secondary evidence of the deposition of the witness, Lane; and because the model is proved not to correspond to the Continental Paper Bag machines; and because the differences between the model and the Continental paper bag machines, so far from being "certain mechanical*
53 *differences stated by said Lane," are very uncertain differences, which Lane confessed he could not explain or show without the presence of one of the Continental machines or the working drawing of the Continental Paper Bag Company from which those machines were made.*]

A. My understanding, as derived from the testimony of Mr. Lane and from the model referred to, is that the blank-feeding and diamond-forming parts of machines for making paper bags used at the Rumford Falls, Maine, factory of the Continental Paper Bag Company, prior to October 10, 1901, and referred to in the testimony of Mr. Lane, were, in all essentials, substantially the same as the machine or the model "Complainant's Exhibit Model of Blank-Feeding and Diamond-Forming Parts of Continental Bag Machine."

To a mechanic, and particularly to a mechanic accustomed, as I have been for many years, to receiving descriptions of machines from men lacking in capacity for precise statement, but not lacking in a mechanical understanding of machines they attempt to describe, the explanations and descriptions given by Mr. Lane in answers to questions 31 to 39 inclusive, are by no means unintelligible, but on the other hand, are in all material particulars distinctly intelligible and clear.

In his answer to question 31 Mr. Lane says, in comparing the model of the Rumford Falls machine, "the cylinder [of the model] is very nearly the same." In his answer to question 36, he explains the difference in these words:

"There is no material difference in them; it is only the Rumford Falls cylinder has been lightened up a good deal, more than the one in the model; the parts are trimmed up like to lighten the weight of the machine up."

The making of the cylinder of the model heavier than that of the original machine is, of course, immaterial, and the cylinder may,

therefore, be taken as corresponding with the cylinder of the Rumford Falls machine.

In the same answer to question 31, after saying "there are other parts that are similar" and that "the movements are the same," Mr. Lane says, "some of the cams are of a different shape than
54 those on the Rumford Falls machine." Being asked in question 33 to explain the difference in some of the cams, Mr. Lane says,

"Taking, for instance, the side clip cam; instead of two cams, one on each side of the cylinder as on the model, there is only one cam on the Rumford Falls machine which operates both side clips. The side nippers [nippers or clips] are a little bit different in shape but they turn the proper bottom of a bag."

What Mr. Lane here says about the employment of one cam instead of two, to operate both side clips of the cylinder is perfectly intelligible to a mechanic. The Liddell patent sued upon, itself makes this perfectly clear. The side clips or fingers G G pivoted to the cylinder C of the Liddell patent are both operated by one cam, namely, the cam I′, Fig. 2, situated at one side of the machine, as shown in both Figs. 1 and 2. All that is necessary to make one cam take the place of two for operating the two side clips is to connect the two clips, and here again the Liddell patent perfectly illustrates such a connection between the side clips or fingers G. The connection is shown at G′ in Figs. 2, 3, and 4 of the Liddell patent. If the clips of the defendant's machine differ in precise form from the clips or fingers G G of the Liddell patent, as I understand them to do, a different arrangement, in some respects, of the connection between the clips may be required, but such connection will necessarily contain and operate upon the same principle, to produce the simultaneous inward movement and the simultaneous outward movement of the two clips when one of them only is acted upon by the cam.

This is one of the most familiar expedients in mechanics and presents no difficulty whatever. It is always optional with the mechanic to employ separate cams for separate movable parts or a single cam for both parts when the movements of the parts are similar. I, therefore, perfectly understand the general construction of the Rumford Falls machine with respect to the side clips, and, in such
55 understanding, I have no hesitation in saying that it corresponds essentially with the model.

In the same answer to question 31, Mr. Lane speaks of certain parts that are present in the Rumford Falls machine and absent in the model, mentioning, "for instance, the diamond fingers forming "the bottom of the bag are not on the model." The diamond fingers have no part in this controversy and are not included among the necessary elements for feeding the bag blanks into the machine nor for forming the diamond. Wherefore, so far as his answer to question 31 is concerned Mr. Lane's statement is clear and conclusive and indicates essential correspondence between the model and the Rumford Falls machine.

In his next statement, in answer to question 32, Mr. Lane, after pointing to important resemblances and essential correspondences, again refers to the difference "in the shape of some of the cams,"

saying that those on the model "produce the same effect as the other machine." There are various modifications in the shapes of cams which do not alter their essential character, and, so long as the effect is the same, the cams may be regarded as essentially identical. It was in answer to the next question that he refers particularly to the employment of one cam instead of two for operating the side clips of the cylinder, and this has been explained to be a wholly immaterial difference, besides being one that makes the Rumford Falls machines themselves rather more closely similar to the construction set forth in the Liddell patent than is the model.

In his answer to question 37, Mr. Lane refers to what he calls the "tucker-plate," being the plate which is oscillated upon its free edge as an axis while said edge presses the blank against the cylinder, and which lifts and carries over the upper layer of the advanced end of the bag-tube. Of this he says, "The tucker plate is similar, "although it is operated different from the Rumford Falls machine." Explaining this difference, he adds, "Instead of the tucker-plate cam "roll, as shown on the model, they run on top of the Rumford Falls "machine, although it has the same in and out motion of the side "nippers." Asked in the next questions 38 and 39 to more
56 closely describe this difference pertaining to the cam rolls to operating the side clips of the tucker plate, he says:

"The side nipper cams [cams for operating the side nippers on the tucker plate] of the model are similar to those on the Rumford Falls machine; on the Rumford Falls machine there is a bracket that comes out on each side of the frame. Instead of a cam roll in the side nipper sleeve there is a fork-like bracket on the Rumford Falls machine with two shoes, instead of a roll as shown on the model with a cam roll running in the cams on the shaft."

By looking at the model it will be seen that the grooved cam-rolls (being the peripherally grooved wheels mounted upon and rotating with the shaft that is situated above the feed-roller shaft at the front of the machine), engage vertical levers that are pivoted between their ends to brackets projecting from the stationary, semi-circular cams that operate the side clips of the cylinder, and that the upper ends of these vertical levers have little rollers upon them which run in the circumferential grooves of the sleeves connected with the side nippers belonging to the tucker plate. (It is these little friction rollers at the upper end of the levers that Mr. Lane says take the place of forks used in the Rumford Falls machine). I understand Mr. Lane to say additionally that the levers which, in the model, are vertical are, in the Rumford Falls machine, extended forwardly over the cam rollers instead of downwardly behind them, and that they are pivoted to brackets projecting from the side frames of the machine instead of being pivoted to brackets which project from stationary semi-circular cams as in the model. Either construction will, as he states they do, give the same effect, and there is no material difference between such constructions. The variation is purely mechanical and has nothing whatever to do in determining the essential character or operation of the machine. Rolls running in grooves are the well known substitutes for forks with two shoes, the

fork shoes run-ing in the groove and straddling the grooved sleeve which is to be slid on its shaft or support in either case.

57 With these explanations, it is evident that the model in evidence is a substantially accurate representation of the Rumford Falls machine in all respects relating to this controversy. The cylinder of the model is found to be the cylinder of the Rumford Falls machines except that it is a little heavier, and its movement is declared to be the same under the general statements of Mr. Lane, applied to the various parts, that "the movements are the same." (See his answer to question 31). The tucker plate is declared to be similar in his answer to question 37. The side nippers of the tucker plate are said in his answer to question 39 to be in the model "similar to those on the Rumford Falls machine" and the difference in the arrangement of the levers for operating these side nippers, as described by Mr. Lane, involves a correspondence in the mounting of the tucker plate of the model with its mounting in the Rumford Falls machine. Besides, in the answer to question 32 Mr. Lane says, "The tucker plate follows the carrier plate on the cylin-" der the same as on the Rumford Falls machine. The *only* differ-" ence I see in it is in the shape of some of the cams, but those that " are on the model produce the same effect as on the other machine."

Mr. Lane points out no difference between the side clips on the cylinder in the model and those in the Rumford Falls machines, but he does point out that both side clips are operated from a single cam in the machines instead of being operated by two cams, one for each, as in the model. The cylinder clips may, therefore, be understood to correspond in the model and machines. So far, therefore, as the cylinder, the clips for the cylinder, the tucker plate and the clips or nippers for the tucker plate, and the movements of all these parts, are concerned, the testimony of Mr. Lane is clear and conclusive, to my mind, that the model corresponds with the Rumford Falls machines, while his explanation of the differences between the cams for operating the clips shows these differences to be immaterial. I do not find any special mention of the finger projecting from the rear edge of the tucker plate in the model, in Mr. Lane's deposition. His statement that the tucker plate is the same in the model as

58 in the machines, however, appears to warrant the understanding that he meant to include this finger as part of the tucker plate, especially as said finger is conspicuous in the model and would have attracted his attention had this finger been absent from the machines.

Wherefore, I conclude that the exhibit model referred to fairly represents the construction and operation of the Rumford Falls machines in all essential respects concerned in this controversy or, in other words, concerned in the feeding in of tucked, tubular, paper-bag blanks and the turning of the diamond upon the advanced end of said blanks by means of a rotary or cylindric bed having side clips and a tucker-plate or forming-plate provided with side clips and a finger for entering the open end of the blank.

[*Mr. Walker objects to the whole of the answer to Q. 7; because it consists mainly of illogical inferences from ambiguous statements*

of the witness Lane, and partly of totally unfounded inferences from the silence of the witness Lane; an example of the first of these kinds of inferences consisting in what this witness has said he thinks Lane meant to say about the side clips or side nippers (of which there are two pairs upon the model); and an example of the second of these inferences consisting in this witness saying that he concludes from the testimony of the witness Lane that the model fairly represents the construction and operation of the Rumford Falls machines in all essential respects concerned in this controversy, in face of the fact that the witness Lane did not mention in any way enough parts of the model to correspond with either claim 1 or claim 2 or claim 7 of the Liddell patent; so that if the present witness should hereafter testify that the model contains all the parts called for by either of those claims the record would contain no evidence that either of the defendant's machines, contain all of these parts. In support of this objection Mr. Walker calls attention to the fact that the witness Lane nowhere testified that the model corresponds with the defendant's machine in general, or with exceptions mentioned or unmentioned by him, and that all that the witness Lane did in the way of comparing the model with the defendant's machine was to mention some particulars in which he said they were similar, and

59 *to mention other particulars in which he said they were different, while leaving several indispensable parts of the model entirely unattended to in his testimony.]*

[Complainant's counsel criticises the above statements put on the record by defendant's counsel, in so far as they purport to state facts, as being incompetent, defendant's counsel is not a witness as yet in this case; and in so far as they argue the case, as immaterial and as very premature, the record not being completed.]

[Adjourned to Wednesday, June 11, 1902, at 10:30 a. m.]

NEW YORK, *June* 11, 1902.

[Met pursuant to adjournment.]

Present: Counsel as before.

MELVILLE E. DAYTON *resumes:*

Direct examination continued by Mr. BETTS:

Q. 8. Now please consider the mechanisms for feeding the blanks and forming the diamonds in the manufacture of paper bags by the Continental Paper Bag Company at Rumford Falls, as illustrated in "Complainant's Exhibit Model of Blank-Feeding and Diamond-Forming Parts of Continental Bag Machine," in connection with the testimony of Albert E. Lane already given and under the understanding set forth by you in your answer to question 7; compare said mechanisms with the Liddell patent No. 558,969, in suit, and with claims 1, 2 and 7 thereof, and state the result of such comparison, giving reasons for any opinions you may express?

[Mr. Walker objects to this question because it assumes that the "model" referred to therein substantially conforms to the Conti-

nental Paper Bag machines referred to therein; whereas no such conformity has been proved.]

60 *[Mr. Walker suggests that it is quite unfair to call the "model," the Continental Paper Bag Machine, or to call it an Exhibit of Parts of the Continental Paper Bag Machine; because the origin of the "model" has never been proved and the "model" has never been connected with the Continental paper bag machine, or the Continental Paper Bag Company in any way; except that the witness Lane has testified that the model is similar to the Continental Paper bag machines in some respects, and different from it in some other respects, and that he was unable to explain or show the differences; and Mr. Walker suggests that the "model" should be given a short and colorless name, such as "Lane Exhibit," which name will serve the purpose of identification, and not falsely represent the origin or character of the model.]*

[Complainant's counsel states that the testimony already taken shows exactly the situation in regard to the complainant's model referred to. It has been offered by complainants as a model substantially and fairly representing certain parts of the defendant's Rumford Falls machines, and complainant's counsel considers its title entirely correct. Whether defendant's counsel is convinced on the identity of the model with parts of defendant's machine, or not, is entirely immaterial to the case.]

A. Relative to the matter of a brief name for "Complainant Exhibit Model for Blank-Feeding and Diamond-Forming Parts of Continental Machine," which seems to be left to me, I notice that I am called upon in the question to consider what is done by the machines of the Continental Paper Bag Company at Rumford Falls, Maine, and to compare said machines of that company with the Liddell patent sued upon. Inasmuch as the exhibit is already marked in evidence as the "Model of Blank-Feeding and Diamond-Forming Parts of the Continental Bag Machine," and inasmuch as the Continental Paper Bag Company is the defendant in this case, I will call the exhibit "Model of Defendant's Machine," wherever I think that briefer name is desirable.

I first state that defendant's machines, as represented by the Exhibit Model Defendant's Machine and Mr. Lane's testimony
61 contains the improvements and has the operation generally stated at lines 19 to 44 inclusive, page 1, of the Liddell patent in suit, which lines I here again quote as follows:

"The tube is received upon a revolving cylinder and carried forward by a nipper, which clamps the lower sheet of the tube * * * The upper sheet of the tube passes above a finger upon a movable forming-plate securely held at a short distance from the revolving cylinder and between which and the cylinder the tube is guided. The forming-plate is then caused to rotate about its rear edge simultaneously with its movement or travel with the revolving cylinder, thereby opening the end of the tube, spreading the side folds, and marking a creased line transversely. Simultaneously with this forming fingers are projected into the side folds [of the tucked blank] one pair being adapted to the cylinder and the other pair to the

forming-plate. A continued movement of the parts causes the upper layer or sheet of the tube to be completely turned backward upon itself, and at the same time the forming-fingers together with the other parts insure the proper formation of the diamond fold. The tube in this shape leaves the revolving cylinder, passes to the pasting devices and thence to the folder."

Defendant's machines, as represented by the Exhibit Model and as understood from Mr. Lane's testimony, manufacture the same form of square-bottomed paper bags from the same form of longitudinally tucked blanks contemplated in the Liddell patent, so that the terms employed in the above quotations taken from the Liddell patent apply throughout the defendant's machines as perfectly as they do to the machine and invention of the Liddell patent itself. The general statement of the Liddell invention contained in said quotation is, therefore, an exact general statement of the construction and operation of defendant's machine.

62 But said statement quoted from the Liddell patent is, in effect, an enumeration of mechanisms and mechanical elements, as well as of operations. It mentions first "a revolving cylinder" as the bed upon which the blank is fed and the diamond is formed. Next, it mentions "a nipper" as the means by which the blank is carried forward with the rotary bed, and it declares that this nipper "clamps the lower sheet of the tube" for this purpose. Next, the statement mentions "a finger upon a movable forming-plate," which finger receives the upper sheet of the tube above it. Of the forming-plate itself the statement says that it is "held a short distance from the revolving cylinder" so that the advance end of the blank is fed or drawn between said forming-plate and the cylinder. The next part of the statement is that the forming-plate is "caused to rotate "about its rear edge simultaneously with its movement or "travel (the movement or travel of the *edge* of the forming-plate) "with the revolving cylinder." This part of the general statement implies the presence of means for *causing* the forming-plate to thus rotate about its edge. Next are mentioned "forming-fingers," "one "pair being adapted to the cylinder and the other pair to the form-"ing-plate," and of these forming-fingers it is said that "they are projected into the side folds" of the tubular tucked blank. Finally the functions of the forming-fingers and other parts are stated to be to "insure the proper formation of the diamond fold," as, in the continued movement of the parts, the forming-plate is revolved upon its edge to turn backward upon itself the upper sheet or layer of the tube.

The model of defendant's machine contains all the mechanisms or mechanical elements here referred to, combined and arranged in substantially the same way, co-operating with each other in substantially the same manner and producing the same results, as set forth in the Liddell patent. There are formal differences in the several parts, but, in my judgment, they are *merely* formal or strictly mechanical, and do not affect the fact of substantial identity between the paper-feeding and diamond-forming parts of defendant's machines with those of the Liddell patent sued upon. And, the differ-

ences between the model and defendant's actual machines
63 having been found in my previous consideration of this matter in connection with Mr. Lane's testimony, to be also merely formal and immaterial, defendant's machines themselves equally and severally contain all the mechanisms and mechanical elements referred to in the general statement above quoted from the Liddell patent, combined and arranged in substantially the same way, as operating with each other in substantially the same manner, and producing the same results, as set forth in the Liddell patent.

Comparing defendant's machines, element for element, with the machine of the Liddell patent as defined in claims 1, 2 and 7, it will be found that said claims read as perfectly to defendant's machines as to the machine shown and described in the Liddell patent and to which these claims are directly drawn.

Taking the claims in order, claim 1 calls for a combination of seven elements; first, a *rotating cylinder;* second, one or more pairs of *side-folding fingers* provided for the rotating cylinder and adapted to be moved toward or from each other; third, a *forming-plate;* fourth, *side-forming fingers* provided for the forming-plate and adapted to be moved towards or from each other; fifth, *means for operating said fingers* at definite times during the formative action upon the bag-tube; sixth, *operating means for the forming-plate* adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder, and, seventh, *means to move the bag-tube* with the cylinder. I have underscored the names of the elements that the eye may more readily detect them.

In the model representing defendant's machine, the *rotating cylinder* is readily recognizable as the large, central revolvable bed of generally cylindric form, mounted upon a shaft which continuously rotates when the machine is in operation. The *side-folding fingers* with which this cylinder is provided in the model are what Mr. Lane calls the "side clips," two pairs of which are present in the model, the cylinder of this model being intended for operation upon two successive blanks in the course of one of its revolutions. The *forming-plate* in the model is the brass plate supported at its middle by a transverse shaft so as to stand opposite the face of the
64 cylinder. The *side-forming fingers* with which this brass forming-plate of the model is provided, are what Mr. Lane calls the "side nippers," there being one at each side of the forming-plate, pivoted to the brass sleeves which slide upon the shaft with which the forming-plate is connected. These "side-forming fingers" for the forming plate are "adapted to be moved towards or from each other by means of the sleeve sliding on the shaft, while the side-folding fingers or side clips belonging to the cylinder are adapted to be moved towards and from each other by being pivoted to the sides of the cylinder structure. The *means for operating said fingers* at definite times during the formative action upon the bag-tube are cams. The fingers or clips belonging to the cylinder are operated in the model by two cams, but Mr. Lane explains that in the defendant's machines themselves both clips of each pair of cylinder-

clips are operated from a single cam, in which respect said machines themselves correspond in detail more nearly with the machine shown and described in the Liddell patent than does the model. The fingers or nippers belonging to the forming-plate are operated in the model by two cams, which I understand from Mr. Lane's testimony to be the same cams which are present in defendant's machines, namely, the large, grooved roller-cams mounted upon the shaft situated above the feed-rollers at the front or entrance side of the machine. These roller-cams operate in defendant's machines, according to Mr. Lane, through pivoted levers terminating in forks which engage the grooves of the sleeve upon which said side-forming fingers or nippers are mounted, the arrangement of these levers connecting the cams with the fingers or nippers being different from that shown in the model, as I explained in a previous answer, but not unlike the levers of the model *in their action*, and giving the same in-and-out movements of the fingers or nippers as in the model. The "*operating means* for the forming-plate," causing "said forming-plate to oscillate about its edge upon the surface of the cylinder "during the rotary movement of said cylinder" consists of a cam, a pivoted lever provided with a segmental rack, and a gear-wheel or pinion secured to the shaft to which the forming-plate is attached, a spring being connected with the lever to hold the latter in engagement with the cam. The "*means to move the bag-tube* with the cylinder" is the central clip or nipper arranged on the cylinder in the path of the incoming bag-tube and in position to seize the advanced end of the lower sheet or fold of the bag-tube.

[*Recess.*]

After Recess.

All the elements of claim 1 of the Liddell patent are, therefore, present in defendant's machine. By operation of the model upon a bag-tube it will be seen that these elements co-operate to open and form the diamond of the bag-tube in the continuous rotation of the cylindric bed in precisely the same way contemplated and described in the Liddell patent. Relative to the formal differences between certain of these elements and those illustrated and described in the Liddell patent, it is first to be noted that the patent expressly contemplates variations in the mechanisms and that the claims sued upon employ the most generic terms in the statement of their elements. Beside the references in the course of the specifications to possible changes, the specification concludes with the words here again quoted as follows:

"It is evident that the mere mechanism for securing the several movements to the different parts may be modified or changed in various ways without departing from the spirit of the invention, and I do not, therefore, confine myself to the details of construction here shown."

It is proper, however, that I should fully recognize and point out to the Court the actual differences between defendant's machines and that shown and described in the Liddell patent sued upon, and

I do so in the order of the parts enumerated in claim 1, which has been above dissected.

66 The first of these parts or elements is called in the claim a "rotating cylinder," this being the rotary bed upon which the blanks are carried while the diamond is being opened and formed. In the Liddell patent this element is shown as being a complete, literal cylinder. In defendant's machine it is not a complete cylinder. There are two opposite transverse recesses in the latter between two cylindric portions upon which the blanks are fed. In other words, defendant's rotary bed is a cylinder with two opposite notches in its periphery. Deferring reference to the reasons for providing these notches, I point out that presence of said notches does not materially change the cylindric character of the rotary bed or affect in any way its operation for the primary and essential purpose of affording a *continuously advancing bed* or support for the bag-tube while having the diamond formed thereon. The cylinder of the Liddell patent, if made of proper size, may be oppositely notched or recessed in exactly the same way without interfering at all with its operation in that machine and without changing the action of any of the parts or the essential character of the machine in any respect whatever. I conclude, therefore, that the presence of these notches in the cylinder of defendant's machine does not lessen in any degree its responsiveness to the first element of claim 1 of the Liddell patent.

Another difference between the cylinder of defendant's machine and that of the Liddell patent sued upon consists in making parts of the cylindric surfaces of the former inwardly movable from their normal position during certain portion of the revolution of the cylinder. But this also manifestly in no wise affects the essential character of the cylinder as *a continuously advancing bed* upon which to support the bag-tube in forming the diamond upon the latter. As will be apparent later, the particular result obtained from such movement of a part of the cylinder surface could be obtained by making the cylinder without such movability of a part of its periphery and giving the entire cylinder bodily movement to the same extent that the movable portion now moves. Such a movement of a cylinder bodily would not affect its character as a

67 "cylinder," obviously, and no more, in my judgment, does the temporary inward movement of a portion of the present cylinder rim.

Wherefore, in my opinion, the "cylinder" or rotary-bed of defendant's machine responds fully and satisfactorily to the first element of claim 1 of the Liddell patent, notwithstanding the peculiarities referred to.

The second element of claim 1 in suit is "one or more pairs of side-folding fingers" for the cylinder, adapted to be moved towards or from each other. In the Liddell patent these are the fingers G G mounted on *radial* pivots and intended to swing into the side folds or tucks of the blank so as to present edges inclined at an angle of forty-five degrees to the side edge of the blank and directed towards the point in the bottom of each of the tucks at which the diamond

fold is to be turned back. In defendant's machine these fingers (called by Mr. Lane "side clips") are pivoted upon axes at *right angles to the radius* of the cylinder, and they move towards and from each other upon these pivots to enter the side tucks of the blanks and, later, to emerge therefrom. Having a downward and inward movement, instead of the precise form of movement given the corresponding fingers G in the Liddell patent, the fingers or "side clips" of defendant's machine are provided with edges which "side clips" of defendant's machine are provided with edges which are permanently inclined at the proper forty-five-degree angle and are moved inwardly just far enough to bring these inclined edges into the desired position, which is the same position as that given the fingers G in the Liddell patent at the time of forming the diamond. These fingers G G of the Liddell patent not only take this position for the purposes of the fold to be made, but they also hold the lower portion of the bag-blank at this point to the cylinder. The swinging fingers of defendant's machine perform this function also, and said cylinder fingers of defendant's machine, therefore, correspond in having in-and-out movement, with those shown and described in the Liddell patent, and in performing the double function, when in the tuck of the blank, of defining the triangular fold of the tucked paper and holding the lower part of the blank
68 to the cylinder during the formation of the diamond. The difference between the cylinder fingers of the defendant's machine and the cylinder fingers G G of the Liddell patent is, therefore, exclusively one of form in the fingers themselves and of a precise direction in their entering and emerging movements. This difference I regard as immaterial in view of the identity of result and mode of action when performing their duty, and I hence consider the cylinder clips of side-folding fingers applied to the cylinder in defendant's machine as responding fully to the second element of claim 1 of the Liddell patent.

The third element of the claim is "a forming-plate." This is the brass oscillatory plate in front of the cylinder in defendant's machine and called by Mr. Lane the tucker plate, as already pointed out. In the Liddell patent this oscillatory forming plate E is seen to have two axes, one an axis of support *e*, situated outside and independent of the cylinder, and another axis at its edge W existing as such only at the time of its operation in forming the diamond on a bag-tube. In defendant's machine the brass forming-plate (as it is shown in the model) has also two axes, one a supporting axis outside and independent of the cylinder, and another at its edge, existing as such in forming the diamond on a bag-tube. This edge of the forming-plate in both cases alike is, at the proper moment in the advance of the bag-tube beneath it, depressed upon the tube and thereafter, in the continued movement of the machine, said edge of the forming-plate proceeds at the same rate of speed with the blank on the cylinder so that it continues to press the blank at a constant line during the formation of the diamond. As I have previously pointed out in discussing the Liddell patent, it is obvious that, if the edge of the forming-plate advances, and the outside and somewhat remote supporting axis of the plate does not advance, with

the cylinder, the outside axis and the surface of the blank must move apart and then approach each other in order that the edge axis of the plate may pass the supporting axis thereof and still continue in bearing upon the blank. This necessary relative move-
69 ment of the two axes of the forming-plate is provided for in the Liddell patent by the outward and inward movement of the external axis *e*, and in the defendant's machine, wherein the outer axis, answering to the axis *e* of the Liddell patent, is stationary, such relative movement of the two axes is provided for by the inward and outward movement of the blank upon which the inner axis or edge of the forming-plate rests. And here we have the explanation of why, in defendant's machine, a portion of the rim of the rotary bed or cylinder is made inwardly and outwardly movable. And it now becomes apparent that defendant's machine in this respect presents a mere reversal of the construction shown in the Liddell patent. Liddell makes the supports for the axis *e* of the oscillatory forming-plate movable and the surface of the rotary bed or cylinder radially immovable, while defendant's machine shows the external axis supports stationary and a portion of the cylinder surface radially movable. The result and the mode of operation are in no wise changed by this mere reversal. In defendant's machine, as in that of the Liddell patent, the forming-plate normally stands flatwise towards the cylinder and at a suitable distance therefrom to admit the entrance of the blank beneath it, and, when the blank has advanced the proper distance, the edge of the forming-plate (standing towards the side of the machine at which the blank enters), is depressed upon the blank and against the cylinder, and thereafter, in the further revolution of the machine, said edge of the forming-plate presses the blank continuously at a single unvarying line of contact and defines the line of fold backwardly upon which the upper sheet or layer of the tube is thrown in opening and forming the diamond. The creasing-edge of the forming-plate in defendant's machine passes the radial line of the outer axis of said plate in the completion of the diamond precisely as the edge W of the forming-plate E of the Liddell patent does, and the forming-plate, therefore is carried, in both machines from its original receiving position, with its creasing edge towards the entering blank, to a position where its creasing edge is beyond the radial plane of the outer supporting axis before the coincident movement of said edge with the cylinder surface ceases. The essential features of
70 construction in the Liddell patent in connection with this forming-plate are, obviously, first, the provision of a supporting axis for the plate outside and independent of the cylinder or rotary-bed, and, secondly, provision for relative movement of the surface of the cylinder and said external axis, radially of the cylinder. By means of these two fundamental provisions and means for causing the edge of the forming-plate to advance coincidently with the surface of the cylinder, against which it bears the blank, the *somersault* movement, so to call it, of the forming-plate is made possible. Defendant's machine, having these essential features pertaining to the forming-plate, has, in my judgment, the third element, or form-

ing-plate of claim 1 of the Liddell patent. The differences between the forming-plates of the two machines lie wholly outside these fundamental features, and are strictly formal and mechanical and not material, as I regard them.

The fourth element of claim 1 of the Liddell patent is the "side forming fingers" with which the forming-plate is provided, said fingers being adapted to move towards or from each other.

In the Liddell patent these side-forming fingers belonging to the forming-plate are the fingers H H, pivoted to the forming-plate outside the path of the blank and adapted to swing into the tucks on opposite sides of the blank to the desired forty-five-degree angle to the creasing edge of said forming plate and to the side edges of the blank, and operating to lift the sides of the upper portions of the bag-tube as the forming-plate is lifted away from the cylinder in its oscillatory or "somersault" movement. The corresponding fingers in defendant's machine have been pointed out as being pivoted to the sleeves which slide inwardly and outwardly towards and from the forming-plate on the shaft to which said forming-plate is attached. Said fingers in defendant's machine, therefore, move directly in and out of the tuck of the paper-tube instead of swinging inwardly and outwardly. In keeping with this difference in precise form or direction of movement, the forming-plate fingers
71 of defendant's machine are made permanently inclined at their inner ends, so that, when inserted the proper distance, said inner ends or edges of the fingers will occupy the proper position for folding the adjacent edges of the triangle involved in the diamond fold. The fingers of defendant's machine perform the same two functions, to wit, the defining of the folds of the triangle and the holding of the upper part of the bag-tube to the swinging forming-plate, that the corresponding fingers H H in the machine of the Liddell patent perform. The differences are therefore merely formal and not functional; and, moreover, in my judgment, they are also merely such as fall within the range of mechanical skill and judgment. I therefore regard the forming fingers in defendant's machine belonging to and accompanying the forming-plate as responding in all essential respects to the fourth element of claim 1 of the Liddell patent.

The fifth element of claim 1 sued upon is "means for operating "said fingers at definite times during the formative action upon the "bag-tube." By trial of the model representing defendant's machine it will be observed that said machine has "means" for this purpose, operating at definite times and producing the results contemplated in the claim. I have already pointed out that such means are cams, as they are in the patent, and that the variations between the forms of the cams employed in defendant's machine and those shown in the Liddell patent sued upon are entirely immaterial and within the choice of the mechanic, and, besides, have directed attention to the express provision in the Liddell patent, at line 14, page 3, "that "the mere mechanism for securing the several movements of the "different parts may be modified or changed in various ways with-"out departing from the spirit of the invention, and I do not, there-

"fore, confine myself to the details of construction here shown." The forms and arrangements of cams for producing the same movements of corresponding parts are exceedingly various in the mechanical arts and afford a wide range of choice to the constructor. In view of this fact and of the further fact that the parts themselves and their operative movements, rather than the particular means for moving them, constitute the essential features in the invention,

72 I consider such differences as exist between defendant's machine and that shown in the patent, in this respect, as wholly immaterial, and regard defendant's machine, in this respect, as responding to the fifth element of the Liddell patent claim 1.

The sixth element of the claim is "operating means for the forming-plate adapted to cause said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder." The means shown in the Liddell patent answering to this sixth element are the cam K′ for lifting the arms F and the gears N M M, rack-wheel M′ and cam K, with the connections between the cam K and the rack-wheel. The means for producing the same results of causing the plate to oscillate about its rear edge upon the surface of the cylinder in defendant's machine is composed of a cam on the top shaft of the model, a lever pivoted between its ends, engaged with the said cam and provided with a segmental rack at its lower end engaged with a gear-wheel or pinion on the shaft to which the forming-plate is attached, and which shaft constitutes the external supporting axis of said forming-plate. These means of producing the same results in the two cases are formally dissimilar, but not essentially so. One is mechanically appropriate to an outwardly and inwardly movable external axis for the forming-plate and the other appropriate to a non-movable external axis of the forming-plate. This difference is, in my judgment, not material under the broad term "operating means" of the claim, and under the express statement made at line 6, page 2, of the specification, that

"In place of these devices for controlling the movement of the plate E relatively to the cylinder C the said plate may be moved or operated by any other suitable means."

I should add that the outward and inward radial movement of the axis *e* of the forming-plate, provided for in the patent by movement of the arms F carrying said axis, is provided for in defendant's machine by a cam regulating the inward and outward movement of the movable section of the cylinder rim, so that, in the *reversal* construction of defendant's machine, the pivotal construction of a portion

73 of the rim of the cylinder and the cam for its control answer to the pivotal arrangement of the arms F of the patent and the cam for the control of their movement. These modifications are merely incidental to the reversal presented by defendant's machine and hereinbefore pointed out; and under the broad provisions of the patent I see no reason, in the differences of construction referred to, why defendant's machine does not fully respond to the sixth element of claim 1 of the Liddell patent.

The seventh element of this claim in the patent is "means to move the bag-tube with the cylinder." The means shown for this purpose

in the drawings of the patent are of two kinds. That kind intended and adapted for handling detached bag-tubes is a central, vibratory clip or nipper mounted on the cylinder and revolving therewith. Defendant's machine has this identical clip or nipper, and it, therefore, contains, the seventh element of claim 1 of the patent sued upon. Defendant's machine, therefore, contains all the elements of said claim 1 of the patent in suit.

[*Adjourned to Thursday, June 12, 1902, at 10:30 a. m.*]

NEW YORK, *June* 12, 1902.

[*Met pursuant to adjournment.*]
Present: Counsel as before.

MELVILLE E. DAYTON, *resumes:*

Direct examination continued by Mr. BETTS:

(Answer to Q. 8 continued.)
I may here, perhaps, as well as anywhere, point out that the notches in the periphery of defendant's cylinder, to which I have before referred, are simply for the accommodation of the forming-plate when the latter is being oscillated back to its normal or starting position after its operation upon a bag-tube, this feature being
74 an obvious incident to the "reversal" feature hereinabove mentioned and not at all concerned in any formative function of the machine. The reason for the notches in defendant's cylinder, therefore, in no wise affects or modifies the above expressed conclusions.

Claim 2 of the Liddell patent contains nine elements of which seven are identical with the seven elements of claim 1, and two are additional. The additional elements are the seventh and eighth in the claim, the seventh being "*a finger* moving with the forming-plate for receiving the upper sheet of the tube and lifting it during the formative action," and the eighth element is "*power devices for returning the forming-plate* to its original position to receive a new bag-tube."

The finger forming the basis of the seventh element of claim 2 is the finger E′ shown in Figs. 3, 4, 5, 6, 7, and 8 of the Liddell patent and illustrated in Figs. 3 and 4 as attached to the side of the forming-plate E opposite the creasing edge W of said plate. The free end of the finger projects towards the incoming, partially open end of the bag-tube so that the upper sheet of the tube passes over the finger, as illustrated by dotted lines in Fig. 3. When the adjacent side or edge of the forming-plate is lifted by the arms F, of course the finger E′ also rises and performs the function mentioned in the claim of "lifting it (the upper sheet of the tube) during the formative action."

Defendant's machine, as represented by the model exhibit and according to the testimony of Mr. Lane, as I understand it, contains this finger, attached to the edge of the forming-plate opposite its creasing edge, as shown in the Liddell patent, and, in the operation

of the machine and model, performs the function assigned to it in the Liddell patent. This finger is longer and reaches farther toward the creasing edge of the forming-plate in the model than in the drawings of the Liddell patent, but this is manifestly a merely mechanical variation that does not in the least change the essential character or function of the finger, and I, therefore, find that defendant's machine contains this element of "a finger moving with the forming-plate" of claim 2 of the Liddell patent.

Defendant's machine also contains the eighth element, or the second additional element, of claim 2, to wit, "power devices
75 for returning the forming-plate to its original position to receive a new bag tube." The power devices shown in the Liddell patent for this return of the forming-plate to its original position are, in part, those by which the forming-plate is swung in the opposite direction. That is to say, the gears N M M., rack-wheel M′ and cams K and K′ are concerned in this return movement of the forming-plate, but the descent of the arms F F may be produced wholly or in part by their weight which, if insufficient, may be augmented by a spring or springs of which one is illustrated at F′ in Fig. 1. If the cam K is to be an "edge cam," as indicated by the dotted lines in Fig. 1, possibly and probably a similar spring to that shown at F′ in connection with the arm F, may be required to hold the friction roller on the inner end of the rod *k* in bearing upon the edge of the cam during a portion of this inner movement of the forming-plate E. Or the making of the cam K in part a "box cam" (a groove presenting two walls for action upon both sides of the friction roller) will insure the same result. Assuming any change to be necessary to the practical result, such change is amply provided for by the statement of the specification beginning at line 6, page 2, which I again quote as follows:

"In place of these devices for controlling the movement of the plate E relatively to the cylinder C the said plate may be moved or operated by any other suitable means. The return movement of the plate E is unimportant, so long as it is secured in time to receive a new bag-tube or section thereof."

In defendant's machine, as in the Liddell patent, the devices concerned in oscillating the forming-plate in its formative movement are also concerned in returning said plate to its original position for the reception of the new bag-tube, a spring being employed in defendant's machine to hold the sector-gear lever to the edge-cam on the top shaft of the model. Said defendant's device is a "power device," answering to the generic designation employed in claim 2, and, its function being the same as that in the Liddell patent and its general mode of operation being the same, besides that its
76 character in the general combination covered by the claim is identical with its character in the Liddell patent, I regard defendant's machine as having the eighth element of said claim 2.

The first six elements and the ninth element being identical with the seven elements of claim 1, which has already been compared with defendant's machine, I find that defendant's machine contains all nine elements of claim 2 of the Liddell patent, combined and co-

operating in substantially the same way and producing the same results, as in said Liddell patent, and defendant's machine, consequently, in my judgment responds fully to said claim 2.

Claim 7 contains seven elements and differs from claim 1 in only one material respect, namely, that it omits reference to the seventh element of claim 1 ("means to move the bag-tube with the cylinder") and includes in its place the element of "connecting mechanism" for timing the movements of the rotary cylinder and the forming-plate. It is therefore, only necessary to examine defendant's machine with reference to this "connecting mechanism" forming the seventh element of claim 7, since the comparison of defendant's machine with claim 1, with respect to the first six elements thereof, applies to the first six elements of claim 7.

The mechanism forming the basis for the last element of claim 7 of the Liddell patent will be recognized by the brief statement that the shaft L, carrying the cams K and K′ through which the arms F and the gears thereon are controlled, is geared directly to the cylinder C by the gear teeth shown at M2 M3 in Fig. 1. The movements of the rotating cylinder and the forming-plate will, therefore, be harmonious and adjusted to each other provided the cams K and K′ are properly formed for this purpose. The descriptive part of the Liddell specification applicable to these matters is found beginning at page 1, line 84, and terminating at line 6, page 2.

Defendant's machine has the cam-shaft at the top of the model and carrying the cam which controls the movement of the forming-plate, also geared with the cylinder, a gear-wheel on the cam-shaft being engaged with a gear-wheel on the cylinder-shaft.

77 Wherefore, defendant's machine contains "connecting "mechanism for timing the movements of the rotating cylin- "der and the forming-plate," and, in this respect, responds fully to the seventh element of claim 7. Defendant's machine having been already shown to contain the first six elements of claim 7 by comparison with the same elements found in claim 1, it follows that said defendant's machine has all the elements of claim 7 combined and co-operating in essentially the same way to produce the same results, and, therefore, responds perfectly to said claim, as a whole.

[*Mr. Walker objects to the foregoing deliverance of more than 5,000 words in response to Q. 8 because it treats as if it were the defendant's machine, a structure which exists in its entirety only in the imagination of the witness, that imaginary machines being accorded to his statements, different from the model marked "Complainant's Exhibit, Model of Blank-Feeding and Diamond-Forming Parts of Continental Bag Machine" in some respects, and different, according to his statement, also from the testimony of the witness, Lane.*]

[*Mr. Walker also objects to the said deliverance of 5,000 words because it contains many excursions of statement and inference into subjects not called for by the question, including conclusions of law, not proper to be set forth in the deposition of a mechanical expert; and because with all its prolixity the deliverance does not really*

"compare said mechanism with the Liddell patent No. 558,969 in suit" as Q. 8 requested, but rather assumes to construe the claims 1, 2 and 7 of the Liddell patent and thereupon to assert that though no one element of either of those claims is found unchanged in what the witness calls the defendant's machine; the differences (which are seldom described with any fullness or accuracy in the deliverance) are immaterial differences.]

[And Mr. Walker emphatically objects to any such deliverance as that which the witness has occuped more than a day in dictating to the typewriter in response to Q. 8, being treated as sworn evidence in this case.]

78 *[Complainant's counsel, in view of the repeated criticisms by defendant's counsel on the record of complainant's evidence as already given in description of the construction and operation of certain portions of defendant's paper-bag making machines at Rumford Falls, asks defendant's counsel, Mr. Walker, if he, Mr. Walker, was not specifically requested, prior to the beginning of complainant's testimony and by complainant's counsel, to put into the hands of complainant's counsel drawings or blue prints illustrating the construction and operation of defendant's Rumford Falls machines in controversy, and to stipulate on the part of the defendants and with complainants as to such construction and operation. Also whether defendant's counsel did not decline to put into the hands of complainant's counsel such drawings or blue prints, or to stipulate in regard to the matter as above referred to.]*

[In response to the foregoing request, defendant's counsel states that nearly nine months ago such a request was made of defendant's counsel by complainant's counsel; and that similar requests have been made by complainant's counsel to defendant's counsel from time to time during the last nine months; and that all those requests have been promptly, distinctly and emphatically declined by defendant's counsel; because in the judgment of defendant's counsel this suit was always a vexatious suit brought without any good foundation and without any reliable knowledge on the part of the complainants of the character of the defendant's paper-bag machines.]

[Mr. Walker also states to the Court that the defendant is building up a new and useful industry in Maine in competition with older and stronger parties, and that the request of complainant's counsel to be furnished with drawings of the defendant's machinery in Rumford Falls, Maine, was entirely unreasonable in the absence of any prima facie showing that that machinery contained anything which anybody could claim to be an infringement of the patent of the complainant.]

79 *[Complainant's counsel asks Mr. Walker, defendant's counsel, if he will now at this stage of the taking of complainant's testimony, and in view of the record already made, submit to the inspection of complainant's counsel and experts, drawings or bl prints illustrating those portions of defendant's Rumford Falls paper-bag machine referred to by the witness, M. E. Dayton, in his testimony, and stipulate on the part of defendant that such drawings represent the construction and operation of such machines by the*

Continental Paper Bag Co. at Rumford Falls, Maine, prior to October 11, 1901, and also that such drawings represent the construction and operation of each and all paper-bag machines manufactured for the Continental Paper Bag Co. by the National Manufacturing Company of Elkhart, Indiana, and furnished to the Continental Company at Rumford Falls during the year prior to October 10, 1901.]

[*In response to the foregoing request, defendant's counsel states that the witness, Dayton, does not appear in his deposition, to have any knowledge of the "defendant's Rumford Falls paper-bag machine," and that his testimony constitutes no such prima facie showing as entitles the complainant's counsel and experts to be informed of the character of the defendant's paper-bag machines in Rumford Falls; and the defendant's counsel further states that the record contains no evidence whatever even tending to show that any paper-bag machines were ever manufactured for the Continental Paper Bag Company by the National Manufacturing Company, or that any such machines were ever furnished by the latter company to the Continental Paper Bag Company, not to speak of evidence tending to show that any such machines, if thus manufactured or furnished, constituted any infringement of the complainant's patent.*]

[*And Mr. Walker calls the attention of the Court to the fact that though the complainants might have begun to take their testimony in this case nearly, or quite, six moths ago if up to that time the complainants had had any knowledge such as they ought to have had before beginning the suit at all; the complainants*
80 *are still apparently fishing for facts, which, if they could be found, even at this late day, might appear to furnish some foundation for the suit.*]

[*For the reason set forth in the last two paragraphs the defendant's counsel distinctly declines to furnish the information called for by complainant's counsel.*]

[*Complainant's counsel suggests that these various requests made have been with a view of facilitating proof rather than with a view of supplying knowledge which was amply in the possession of complainant's counsel before suit was begun.*]

[*Direct examination closed.*]

[*Recess.*]

After Recess.

Cross-examination by Mr. WALKER:

X Q. 9. Was any paper bag machine ever made in conformity to the Liddell patent in suit?

A. I do not know.

X Q. 10. Did you ever see any model which appeared to you to have been made from the drawings of that patent?

[*Objected to as immaterial and not called out by the direct.*]

A. I have seen such a model.

X Q. 11. Where and when did that seeing occur?

[*Same objections.*]

A. I saw it some months ago in the course of its construction in this city and I have seen it again during the present week.

X Q. 12. Where is that model now?

[*Same objections.*]

81 A. In a room adjoining this in which we are taking this testimony.

X Q. 13. Was that model presented to my examination by you or by complainant's counsel at any time while you were giving your testimony in direct examination so that I might more readily understand your statements relevant to the character of the Liddell paper-bag machine shown in the drawings of the Liddell patent?

[*Same objections.*]

A. I know nothing of what complainant's counsel may have done relative to the matter of the question; I only know that I have not called the attention of defendant's counsel to said model, and it has not occurred to me that he could derive any aid from the model to his understanding of the Liddell patent. I had no difficulty in understanding the Liddell patent without the aid of a model. I may add that the model has not been under my control at any time during its construction, or since.

X Q. 14. Why did you ever take time to look at that model at all?

[*Same objections.*]

A. I was called upon to advise with the constructor in making it, and I have examined it since to see that it was constructed in accordance with the patent.

X Q. 15. Why was that model made?

[*Same objections; also as without foundation.*]

A. I don't know.

X Q. 16. Was it not made to be offered in evidence in connection with your deposition to show the Court a physical embodiment of the somewhat complicated machine shown in the drawings of the Liddell patent?

[*Same objections.*]

A. So far as I am aware it has never been considered necessary to accompany my *prima facie* deposition.

82 X Q. 17. Your answer is inconclusive, because such a necessity may have arisen for the first time in this case; and because such a thing might have been done or proposed without necessity. Please, therefore, to answer X Q. 16 more responsively?

[*Same objection.*]

A. Counsel will naturally understand that I have and have had no control or determining voice either in the proposition to make such a model or in the use or time of use of it. As to what purpose has been had in view in the construction of the model I can know, and do know, only by information, and I am free to say, I think,

that it is the intention of complainant's counsel to submit the model to the Court, and it may be that the model will be used in connection with my rebuttal deposition. All this is a matter outside my control and within the discretion of counsel for complainant, as a matter of course.

[*Defendant's counsel requests complainant's counsel to exhibit the model of the Liddell paper-bag machine to defendant's counsel and to permit defendant's counsel to continue to have access to that model during the cross-examination of this witness in order to enable defendant's counsel to ascertain by cross questions in the presence of that model whether the witness has been in error in any of the statements he has made about how a machine constructed like the drawings of the Liddell patent will work.*]

[*Complainant's counsel also states that any model which complainants desire in the case as part of the record will be duly offered and marked in evidence at the proper time, in the judgment of complainant's counsel, and will thereafter be open to the inspection of defendant's counsel. The description and drawings of the Liddell patent in suit, in themselves and as elucidated by Mr. Dayton's deposition, are so clear that they furnish ample information to Mr. Walker for cross examination. If defendant's counsel desires*

83 *or needs the instruction of a model, defendants are amply able to furnish one themselves, and very likely to have made one for all that is known to complainant's counsel.*]

[*Mr. Walker responds to the statement of defendant's counsel by saying that he has himself been well acquainted with paper-bag machinery of the class to which the Liddell patent belongs for nearly twenty years; and that he believes that he thoroughly understands the drawings and specification of the Liddell patent; and so understanding, he believes that the witness, Dayton, has, in his deposition, made a number of material errors of statement as to how the parts of a machine constructed like the drawings of the Liddell patent will work, and that the question whether the witness is wrong or is right on those points can soonest be determined by practical tests of a machine thus constructed; and that the model now present is understood by Mr. Walker to be the only model or machine that ever was built in accordance with the drawings of the Liddell patent; and that, if the defendants were to go to the expense of making such a model or machine and that model or machine were to demonstrate the errors which have been made by this witness as to how such a machine will work; the complainant's counsel would probably claim that the model thus made by the defendant was not made with the desire of successful working, and was, therefore, unconvincing upon the point. On the other hand, if the complainant has made a model like the drawings of the Lid. ll patent which will work to perform some useful function, and will work in accordance with the statements of the witness, those facts can be proved once for all, beyond question, by simply producing and using the model already in this office.*]

[*And defendant's counsel notifies complainant's counsel that unless that model is thus produced and submitted to the examination of defendant's counsel at this time, defendant's counsel will argue on the*

hearing that its existence and its concealment constitute convincing circumstantial evidence that the Liddell patent is void for want of utility, because no machine constructed in conformity thereto can perform any useful function in the manufacture of paper bags,
84 *but on the contrary, would spoil whatever paper might be delivered to it for that purpose.*]

[*Complainant's counsel suggests that defendants had better prove this last proposition as matter of fact, instead of relying upon Mr. Walker's argument at final hearing if it is susceptible of proof, and objects to the rest of defendant's counsel's statement as improper and incompetent putting testimony and argument on the record in the guise of objections.*]

X Q. 18. Did you ever examine carefully either of the following prior patents which I now show you, namely: No. 242,661 of June 7, 1881, to Leinbach, Wolle and Brunner; No. 327,280 of September 29, 1885, to Leinbach, Wolle and Brunner; No. 331,722 of December 1, 1885, to Lorenz and Honiss; No. 333,647 of January 5, 1886, to Lorenz and Honiss; No. 337,964 of March 16, 1886, to Lorenz and Honiss; No. 337,965 of March 16, 1886, to Lorenz and Honiss; No. 337,966 of March 16, 1886, to Lorenz and Honiss; No. 361,951 of April 26, 1887, to Lorenz and Honiss; No. 407,794 of July 30, 1889, to Stilwell; No. 410,841 of September 10, 1889, to Lorenz and Claussen; No. 410,842 of September 10, 1889, to Lorenz and Honiss; No. 418,201 of December 31, 1889, to Lorenz; No. 444,727 of January 13, 1891, to Claussen; No. 444,728 of January 13, 1891, to Lorenz; No. 444,729 of January 13, 1891, to Lorenz and Claussen; No. 459,445 of September 15, 1891, to Lorenz and Claussen; No. 534,512 of February 19, 1895, to Lorenz and Claussen?

[*Complainant's counsel, in view of the fact that none of these patents referred to in the question have been in any way referred to in the direct examination, either in question or answer, asks defendant's counsel to state his object in asking the above question and how he proposes to follow it up.*]

[*In response to this request, defendant's counsel states that each of the sixteen patents mentioned in the question describes a machine adapted to do exactly the same work upon a paper bag blank*
85 *which the Liddell patent purports to show how to do by the machine shown in the drawings of that patent, so that the Liddell patent stands No. 17 in the specific art to which it relates. The relevancy of the question consists in the fact that the witness, Dayton, in his direct examination has said that no one of the elements of claim- 1, 2 or 7 of the Liddell patent is found unchanged in the machine that he pleases to call the defendant's machine, but that devices are shown in the last mentioned machine which perform the same functions as those performed by all of the elements specified in those three claims respectively; and that the differences between the devices in the last mentioned machine and what he thinks are corresponding elements in the three claims are immaterial differences. Now, it is well known to those conversant with patent litigation that the question whether a particular difference between a machine al-*

leged to infringe a particular claim and the precise devices shown in the patent to which that claim belongs is a material difference, is a question that depends upon whether the patent is a primary patent in the art to which it belongs, or is a secondary patent in that art, or stands as low as No. 17 in that art. For this reason, if any weight is to be given to the opinion of the present witness upon the significance of the admitted differences between what he calls the defendant's machine and the mechanism shown in the Liddell patent, it is necessary to know whether he treated the Liddell patent as a primary patent in the absence of any knowledge of the prior art on the one hand, or whether on the other hand he was acquainted with the prior art as it is shown in the sixteen prior patents and gave his testimony in view of all those patents.]

[Mr. Walker adds in response to the last request of complainant's counsel that if this witness answers the present question in the negative, no further question will be put to him relevant to the sixteen patents, or either of them; but that if this witness answers the present question in the affirmative, it will be necessary to cross-examine him at length relevant to such of those patents as he shall say he has carefully examined.]

86 *[Complainant's counsel objects to so much of above statement by defendant's counsel as is testimony, on the ground that it is incompetent, and to so much as is argument on the ground that it is immaterial. But as it is evident from the statement as a whole that defendant's counsel proposes to go into the art prior to the Liddell patent in cross-examination if the witness, Dayton, states that he has carefully examined any of the prior patents referred to, and in view of the fact that the direct examination, both in question and answer, has carefully avoided reference to such prior art in any way, complainant's counsel objects to the above question as improper cross-examination, without foundation in the direct, incompetent and immaterial, and instructs the witness that as complainant's counsel understands the law governing this matter, the witness is not obliged to answer such a question, and further instructs the witness that he should not answer this question until said question in connection with this record is referred to a judge of this Court for his opinion thereon and some order or direction made by such judge that the witness should answer said question.]*

A. Under the instruction of complainant's counsel that I should not answer this question until it has been submitted to a judge of this Court for his direction in the matter, I feel compelled to decline to answer the question for the present.

X Q. 19. When first did you have your professional attention called to any paper-bag machine patents?

A. Fifteen or twenty years ago, I should say.

X Q 20. To what extent, in point of time, did you give any consideration to the art of paper-bag machines before you were employed as an expert in this case?

A. That would be hard to say.

X Q. 21. Did you ever before give a deposition in any patent case involving paper-bag machinery?

A. I never did.

X Q. 22. Did you ever personally solicit a paper-bag machine patent by drawing the specification and claims thereof (whether upon your own drawings or those of another)?

87 A. I am not certain whether my services in connection with paper bags and machinery for making such bags included the preparation of a specification or specifications for patent or patents or not.

X Q. 23. Did you ever invent or design any paper bag machinery?

A. No.

X Q. 24. Did you ever take any part in building any paper bag machines?

A. None, except in connection with the construction of a model of the Liddell machine, concerning which I advised with the constructor only. I did no part of the actual building in that case.

X Q. 25. Have you any knowledge derived from experience or actual observation of how to take a new paper-bag machine as it comes from the factory where it was made and then adjust that machine to actual running in a paper bag factory so that the entire cycle of its operations will be performed in less than one second of time, hour after hour, and day after day, with smoothness and accuracy, while making paper bags at the rate of from 70 to 100 a minute?

A. Not from having done so in any case; but if a machine came to my hand which, when adjusted properly, would be capable of running at the speed and in the manner stated in the question, I should know how to make the adjustment, having seen some of this sort of adjusting done by others and having sufficient mechanical skill and experience to enable me to do such work on such a machine.

X Q. 26. I fear you much underestimate the special difficulties which the ablest practical mechanic who works with his hands all the time must meet in the work of taking the most perfectly constructed paper bag machine which has never been used and making that machine run successfuly; and therefore, I ask you whether you were ever present when anybody began that work on any paper bag machine and remained present until the work was done so as to positively learn what special difficulties reside in drawing a continuous roll of paper into one end of a paper bag machine and turn-

88 ing out perfect paper bags at the other end automatically at the rate of 100 a minute?

A. I never saw a complete paper bag machine undergoing the operation of adjustment continuously from beginning to end, but I have seen critical parts of paper bag-forming machinery undergoing such adjustment and have assisted in making the adjustment.

X Q. 27. Did those events occur in connection with the models referred to already in your deposition?

A. One such event occurred in connection with one of said models, and others occurred in connection with other structures not part or parts of said models or either of them.

X Q. 28. Did you ever do anything in the presence of any paper bag machine, or model of any paper bag machine for any other purpose than to prepare yourself to give this deposition?

A. Yes; fifteen or twenty years ago I did something of that sort.

X Q. 29. It is true, is it not, that the statements made by you in this deposition on mechanical points are based on your theoretical knowledge of mechanics and machinery, and are not based upon any practical experience you have ever had in inventing, designing, manufacturing or running any paper bag machinery?

A. The first part of the question is not true; the statements which I have made are not based solely upon my theoretic knowledge of mechanics. They are based upon my practical knowledge of mechanics generally, and upon my practical knowledge, so far as certain parts of the Liddell machine are concerned, and upon my practical manual operation and handling of said parts. It is true that I have never matured any invention in paper bag machinery, though I have conceived what I believe are some valuable mechanisms for such machines, and I have never designed a paper bag machine, manufactured one or been employed in the running or operation of a complete machine.

X Q. 30. Did you ever visit any paper bag factory where paper bags like those which the Liddell patent purports to show how to manufacture, were being made for sale?

89 A. I think such bags were being made for sale in two factories which I have visited. The visits were so long ago that I am not now quite certain.

X Q. 31. How long ago were those visits and where were those factories?

A. One was fully fifteen years ago, I should say, to a factory at Batavia, Illinois; other visits were made to a paper bag factory in the city of Chicago, ten years or more ago.

X Q. 32. Who was the proprietor of the Chicago factory?

A. The factory in Chicago to which I refer was that under the control of the Fishers, and was either then, or has since become known as the Union Paper Bag Company, or some similar name.

X Q. 33. Refresh your recollection, and state as accurately as you can, how many years ago it was that you visited the Fisher factory which you have said was ten years, or more, ago?

A. I cannot be more specific as to date. I was then a resident of Chicago, as I had been and thereafter was, for a number of years, and I have now no means of fixing the date definitely.

X Q. 34. Am I right in understanding you to say that you are not certain that the square-bottom bags which the Liddell patent purports to show how to make were being made in the Batavia factory when you visited it about fifteen years ago, or in the Fisher factory when you visited it about ten years ago?

A. You are quite right. The precise subject of my investigations at those times have escaped my mind, or are confused by reason of the fact that hundreds and perhaps thousands of mechanical questions and patents have been matters of consideration by me since those dates. It is to be borne in mind that I do not pretend to state the dates with quite the definiteness indicated in the question.

X Q. 35. Is it outside of your knowledge that scores of paper-

bag machines made in close conformity to the Lorenz and Honiss patent, 361,951, of April 26, 1887, have been running in the State of New York all the time for the last sixteen years, making paper bags identical with those which the Liddell patent in suit purports to show how to make, or help to make?

[*Complainant's counsel objects to the above question as improper cross-examination, not in any way founded upon the direct examination or called out thereby, but an attempt to go into the prior art on the part of the defendants in connection with complainant's opening case, said art being susceptible to proof by defendants in their own time and on their own case, and incidentally, at their own expense. Complainant's counsel refers to his statements and objections made after X Q. 18, involving a similar attempt on the part of defendant's counsel, and instructs the witness that the question is of such a character and open to such objections under the rulings of the courts as understood by complainant's counsel, that the witness should not answer until it has first been submitted to the Court and the instructions of the Court given that this question should be answered.*]

[*Mr. Walker states to the Court that the question appears to him to be material and proper on cross-examination, because the answer will tend to show whether the witness has any practical knowledge of the great art of automatic paper-bag machinery to which the patent in suit purports to relate, as that art has been developed in the United States on an enormous commercial scale during the last sixteen years.*]

[*Complainant's counsel characterizes the question as ingeniously worded to get into the prior art under pretense of an inquiry as to the expert's qualifications.*]

A. Under the instructions of complainant's counsel, I feel compelled to decline to answer the question at present.

X Q. 36. Is it outside of your knowledge that hundreds of paper-bag machines made in close conformity to the Stilwell patent, 407,794, of July 30, 1889, have been running all the time in the United States for more than twelve years manufacturing paper bags identical with those which the Liddell patent in suit purports to show how to make or help to make?

91 [*Same objections as to the last previous question, X Q. 35; also as immaterial and same statement and instruction to the witness.*]

A. Under the instruction of complainant's counsel, I feel compelled to decline to answer the question at present.

[*Adjourned to Friday, June 13, 1902, at 10:30 A. M.*]

NEW YORK, *June* 13, 1902.

[*Met pursuant to adjournment.*]

Present: Counsel as before.

MELVILLE E. DAYTON resumes.

Cross-examination continued by Mr. WALKER:

X Q. 36. Who was the constructor of the Liddell model mentioned in answer to X Q. 14?

A. Mr. George R. Ward.

X Q. 37. Where and when did Mr. Ward construct that model?

[*Objected to as immaterial.*]

A. At the time I saw him at work upon it the work was being done at a machine shop in this city. I now forget the names of the proprietors and the precise location.

X Q. 38. Has Mr. Ward been present substantially all the time during the taking of your deposition?

[*Same objection.*]

A. He has been present a considerable portion of the time.

X Q. 39. Is he here now?

[*Same objection.*]

A. He is.

X Q. 40. Did William Liddell take any part in planning or producing the Liddell model?

[*Same objection.*]

92 A. Not that I know of.

X Q. 41. Did you ever meet William Liddell?

[*Same objection.*]

A. I never did.

X Q. 42. Was the Liddell model made from working drawings?

[*Complainant's counsel objects to the line of cross examination very vigorously which defendant's counsel is pursuing, for the reason that the model referred to has not been introduced into this case, and was not referred to on the direct examination. This entire line of cross examination is therefore irrelevant and entirely immaterial.*]

A. I don't know, I only saw the patent drawings in connection therewith.

X Q. 43. Does the Liddell model in its present condition accurately conform to the patent drawings; or does it contain some improvements thereon?

[*With the consent of counsel, the objection to the last question will be considered as made in regard to every question relating to the Liddell model.*]

A. It contains no improvements thereon and conforms to the Liddell patent with substantial accuracy.

X Q. 44. Has any diamond paper bag blank like that shown in Fig. 8 of the Liddell patent ever been automatically made upon the Liddell model through the steps of folding shown in Figures 5 to 8 of the Liddell drawing?

A. Yes, several of them.

X Q. 45. How was motion imparted to the gear M2 and through that gear in one direction to the cylinder C, and through the shaft L of that gear in another direction to the forming-plate E?

A. By hand, through the medium of a hand wheel.

X Q. 46. Was any diamond formed blank ever made on the Liddell model without other human intervention than to
93 feed a tucked paper tube into the model and turn the hand wheel?

A. Yes.

X Q. 47. How many such folding operations have been thus successfully performed by the Liddell model?

A. I don't know.

X Q. 48. The number of successful operations was smaller, was it not, than the number of the attempts and failures?

A. All that I have witnessed have been successful.

X Q. 49. When did you witness them?

A. During the present week, mainly before going on the stand to make this deposition.

X Q. 50. When did you first see a Liddell model while it was being built?

A. Some weeks ago.

X Q. 51. Was the number of weeks about twenty-five?

A. No. Perhaps two months ago. I am not certain about the date or I would very willingly give it. On reflection I think it was rather more than eight weeks ago, perhaps ten.

X Q. 52. When you first saw that model being constructed, how far had that construction advanced?

A. A frame had been built and set up with the shafts in place, the cylinder mounted, a forming-plate provided, together with some other parts, but the gears were mainly absent and other parts were wanting.

X Q. 53. Were the cams K and K′ on the model at that time?

A. They were not.

X Q. 54. Was the nipper *c* on the model at that time?

A. It was.

X Q. 55. Were the cylinder fingers G G and the forming-plate fingers H H on the model at that time?

A. I believe they were in process of construction or of application.

X Q. 56. Are the same fingers G G H H on the model now?

A. I don't know that these are the same fingers.

X Q. 57. Did you notice the original fingers G G H H closely?

A. I think I did, but not with any such purpose as to subsequently identify them individually.

X Q. 58. Were those original fingers G G and H H
94 adapted to turn on axes at right angles to the surface of the periphery of the cylinder; or more strictly speaking, on lines radial to the cylinder as shown in the Liddell patent?

A. Such axes were provided, or in part provided, for the fingers.

X Q. 59. Are those fingers constructed and arranged on the Liddell model now in the particular way shown in the drawings of the Liddell patent including the fact of turning on axes radial to the cylinder and being connected together by a rod so that both fingers G may be worked by one cam and so that both fingers H may be worked by one cam?

A. They are.

X Q. 60. Are the under sides of the working ends of those fingers in planes at right angles to the axes of those fingers; or are those under sides inclined in one direction or the other relatively to planes at right angles to those axes?

A. I have not examined them minutely to determine precisely the fact as to the exact relation of the under surface of the fingers to their axes. The relation of such surfaces to the axes is generally, and perhaps exactly, that stated in the question.

X Q. 61. I call your attention to the fact that the Liddell patent everywhere speaks of the device *c* as a nipper, and shows the working end of that nipper pressing directly down upon the periphery of the cylinder so as to firmly clasp the forward end of the underply of the tucked paper tube down upon the cylinder; and I call your attention to the fact that the Liddell patent everywhere denominates the parts G and H as fingers, and that the drawings of the Liddell patent everywhere show the fingers G as adapted to turn inwardly over the periphery of the cylinder without any possibility of pressing downward upon the cylinder, and with a considerable space between the undersides of the fingers G and the periphery of the cylinder as shown in Figure 4; and that the drawings of the Liddell patent show the fingers H as adapted to turn inwardly under the forming-plate E without any possibility of pressing upon that plate and with a considerable space between the fingers H and the plate E as also shown in Figure 4. Now please to state
95 whether the Liddell model agrees with the drawings of the Liddell patent in respect of leaving those spaces between the fingers G and the periphery of the cylinder, and also in respect to leaving those spaces between the fingers H and the adjacent plate E even when the fingers H and the fingers G are turned inwardly into the tucks of the paper tube as they are shown in Figure 4 of the drawings of the Liddell patent?

A. I would like to ask counsel whether I am to attach any significance to the general opening statements preceding the query proper in the above inquiry, or whether, after all, the question I am to answer is confined exclusively to the last sentence of the interrogatory?

[*Defendant's counsel states that the question to be answered by the witness is confined to the last sentence of the interrogatory.*]

A. With the explanation of counsel, I reply that in the Liddell model there is agreement with the drawings of the Liddell patent in respect of spaces between the fingers G and the periphery of the cylinder and in respect of spaces between th- fingers H and the forming-

plate E, even when the fingers are turned inwardly into the tucks of the paper tube—and necessarily so, because room must be provided between the fingers and the cylinder and between the fingers and the forming-plate for the double thickness of paper held to the cylinder and plate respectively by said fingers. There is some irregularity in said spaces as shown in the drawings Figs. 3 and 4 of the Liddell patent, and, indeed, an inequality in the spaces shown in Fig. 4 where the fingers are represented thrown inward. As to the lower finger G in Fig. 4, no space at all is actually discernible practically; all of which shows that the drawings of the patent are not intended to precisely indicate the exact space to be provided in a working machine or working model. I do not wish to be understood as saying that the model corresponds with these Figures of the drawing, or either of them, in respect of such irregularities and inequalities, but only that the model is made to follow the drawings in this particular with reference to the thickness of the paper of such bag-tubes as are to be operated upon in the machine.

96

X Q. 62. As the Liddell machine now exists, do the fingers H approach the surface of the plate E as they enter the tucks of the paper tube, or do they travel parallel with the surface of the plate E as they enter the tucks of the paper tube?

A. I believe they travel parallel with the plate, albeit, I see no reason why they might not be made to approach it if necessary.

X Q. 63. I believe that necessity to exist and to have been unknown to Mr. Liddell at the time he applied for the patent in suit, and anyhow, the patent recognizes no such necessity and makes no provision therefor, but, on the contrary, as we both know, it provides for the fingers H moving parallel to the plate E as the fingers enter the tucks of the paper tube, and makes no provision for the fingers H approaching the plate E at that time. This is why I want to prove by you, if I can, whether the Liddell model agrees with the Liddell patent in that respect or disagrees therewith. Please, therefore, to state whether as the Liddell model is now constructed the upper surfaces of the fingers H approach the under surface of the plate E as those fingers enter the tucks of the paper tube, or whether the upper surfaces of the fingers H travel parallel to the adjacent surfaces of the plate E at that time?

[*Complainant's counsel calls the attention of the Court to the impropriety of the insertion of argument in this manner by defendant's counsel. Both the argument and the query contained in the last question are out of place, since the question has already been answered by the witness.*]

A. I refer to my last answer to the same question where I said, "I believe they travel parallel with the plate." It is to be understood that I make no inspection of the model referred to before giving my answers concerning said model, and speak only from knowledge acquired from seeing the model at work before my examination and when I had no expectation of being questioned about it at all in this *prima facie* deposition.

97 In view of the fact that counsel, in the early part of his last question, assumes to state what I know as well as what he knows, I feel called upon to say that I do not know, as he asserts, that the Liddell patent "provides for the fingers H moving parallel to the plate E as the fingers enter the tucks of the paper tube." There is not a single word in the Liddell specification to that effect. The entire statement of the patent as to the mounting of said fingers is contained in the paragraph beginning at line 14 of page 2, and ending with line 42 of the same page. At the beginning of this paragraph the pivotal mounting of the fingers G G belonging to the cylinder is described as follows:

"The cylinder C has pivoted upon its periphery fingers G G"

and this, with a statement that they are situated normally out of line of the bag-tube and that they "may be projected inwardly by the action of the cam I'" is absolutely all that is said in the patent concerning the pivoting of these fingers G G. A very slight inclination of the pivot of each of these fingers G G, so slight as to be unrepresentable in the drawings, would cause the free ends of said fingers to press against the paper of the bag-tube lying between said fingers and the cylinder to any extent that might be desired, if such results were wanted at all. The statement as to the fingers H H is found at line 32 in the paragraph above indicated and reads as follows:

"This former-plate E is also provided with fingers H H, corresponding to the fingers G G,"

and this is all that is said about the pivoting of the fingers H H. The same thing is true, therefore, of the fingers H H that is true, and that I have above stated, of the fingers G G. That is to say, there is absolutely nothing in the Liddell patent positively to the effect that said fingers H H move parallel with the surface of the forming-plate E, and nothing prohibitory of a movement of said fingers out of parallel with the adjacent surface of that plate, provided it be thought or found necessary or desirable that they move otherwise than parallel.

98 Nevertheless, I repeat the fingers in the model do, I believe, move parallel with the surface of said plate.

X Q. 64. I repeated X Q 62 with an explanation in X Q. 63 because your answer to X Q. 62 was limited to your belief. Now your belief is probably no better than mine, and I believe that those fingers H approach the surface of the plate E as they enter the tucks of the paper tube. What I want upon the point is a statement of the fact, or a statement that you don't know the fact. Please, therefore, to tell whether you know the fact, and if so, what the fact is; or if you do not know the fact on the point, please to say that, and I will drop the topic?

A. I will not swear positively, without a special inspection of the model as to this matter, whether or not there is any degree of approach or of recession of the points of the fingers H towards or from the adjacent surface of the forming-plate E when said fingers are swung inwardly, but I do know that it was concluded to make the

fingers without such approach, having determined that they were operative without such approach, and, speaking from my observation of the fingers at work in this model, I again express the *belief* that they do not approach the forming-plate, but swing inward parallel with the latter. And such *belief* amounts practically to knowledge.

X Q. 65. Am I right in understanding from your last answer that the point was discussed between you and Mr. Ward as to whether the fingers H would be operative if their motion was parallel to the surface of the plate E?

A. You may understand that the question as to how they would *best* operate was discussed between Mr. Ward and myself.

X Q. 66. Was that question settled upon theoretic consideration or was it settled by experiment?

[*This question is objected to as being highly improper for reasons which have been previously set forth by complainant's counsel; the model in question forms no part of this record, and neither has defendant's counsel any knowledge that it will be introduced.*]

99 [*Mr. Walker explains to the Court that the defendant's answer in this case states that the patent in suit is void for want of utility because a paper bag machine constructed in conformity thereto would not perform any useful function in the manufacture of paper bags, but would spoil the paper that might be supplied to it for that purpose; and Mr. Walker calls the attention of the Court to the fact that it appears in the deposition of this witness that the complainant has undertaken to build a model in conformity to the patent in suit, and that that model is now present in this office, but that the complainant's counsel is unwilling to show it to the defendant's counsel and strenuously objects on the record to this witness being asked the facts about that model and its origin and history.*]

[*Mr. Walker submits to the Court that X Q. 66 is material to the suit because the answer thereto and to other questions which may follow it will tend to show whether the complainant's counsel is concealing the model in question for the reason that the facts about it would invalidate the Liddell patent for want of utility; and Mr. Walker further suggests that the question, of being material, is proper on cross-examination because it relates to the essential character of the patent which the direct examination was largely occupied in expounding.*]

A. I understand the interrogatory to ask whether the "question " as to how they (the fingers) would *best* operate," which, in my last answer, I said was discussed between Mr. Ward and myself, was settled between Mr. Ward and myself "upon theoretic consideration" or "by experiment." It will be observed that in my last answer there was involved no question of operativeness at all, but only a question of operativeness in the *best* manner, or of adjustment for the *best* operation. Mr. Ward appeared to be fully conversant with the practice of making similar fingers press the paper with some force, as, for example, in the corresponding devices of complainant's exhibit Model of Defendant's Machine, and it was obvious to

both of us that such pressing action of the swinging fingers shown in the Liddell patent could be readily obtained by mere ad-
100 justment of the axes or pivots of said fingers, or otherwise, if preferred. It was, however, determined to make the fingers swing into the tucks of the bag-tube without special adjustment for the purpose of giving more than their normal and incidental pressure upon the paper, and this I believe is their condition in the operative model referred to.

In this connection, I beg to refer defendant's counsel and the Court to X Q. 26 of this deposition in which counsel enlarges upon the "special difficulties which the ablest practical mechanic who "works with his hands all the time must meet in the work of taking "the most perfectly constructed paper bag machine which has ever "been used and making that machine run successfully." This statement, it seems to me, justifies the exercise of some deliberation and care in making a machine or operative model directly from a patent, in the first instance.

X Q. 67. I want your testimony on a simple and precise point of fact; and therefore, I inquire of you whether you have any knowledge upon which anybody can rely that the fingers H of the Liddell model ever did move inward parallel with the plate E. Now, this is a simple point of fact, and may or may not be within your knowledge. Please to tell the truth about it if you know that truth, or if you don't know that truth, then say that you don't know, and please omit to express any pious wishes or esoteric faith you may have upon the subject?

[*The question is objected to both for the reasons that it has been three times answered already, and for the reason that defendant's counsel assumes to dictate the manner in which it shall be answered.*]

A. I don't think I can give any better answer than I have given already three times in response to X Q. 62, X Q. 63, and X Q. 64.

X Q. 68. Your answer to X Q. 64 was no answer to X Q. 67, because your answer to X Q. 64 is confined to the model as it now exists, whereas X Q. 67 covers the entire history of the model; and your answer to X Q. 62 did not amount to anything because it is confined to your belief which may very well have been un-
101 founded for aught I know; and your answer to X Q. 63 did not amount to anything because it did not even express your then existing belief, but only called my attention to the fact you had formerly had a belief on the point. Now, Mr. Dayton, please to answer X Q. 67 as it stands?

A. To go to the extent of my actual knowledge, I will say that I have never known of the fingers H being mounted otherwise in the model than to swing parallel with the plate, and that they have always appeared to me to swing parallel with the plate, though I have never made any micrometric measurements to determine this fact.

X Q. 69. Have you any knowledge on that point one way or the other upon which anybody can rely for a moment?

A. None, except that I have advised that the fingers be so mounted, and that I understand them to be so mounted. This

much, I *know* in the absolute sense of that term, which I understand to be its sense in the question.

X Q. 70. Why did you advise those fingers to be mounted so as to move inward parallel to the plate E?

A. Because I knew them to be operative when thus mounted, and because Mr. Ward in his stated knowledge of prior constructions, raised the question. This is my recollection.

X Q. 71. Was your knowledge that those fingers would be operative when thus mounted, based on theory entirely, or was it based upon having seen square-bottom paper bags made by machinery with corresponding fingers thus mounted?

A. Neither. It was based upon demonstration, but not in a complete paper bag machine.

X Q. 72. Was that demonstration the result of some experiments performed by you with paper to satisfy your own mind upon the point?

A. That demonstration was the result of making and operating enough of the Liddell machine to afford the demonstration.

[*Recess.*]

102 After Recess.

X Q. 73. Does the Liddell model contain the cams K K′ the arm F′, and rod k, the rod k^2, the gears M′ M M and N, the arms F, the spring F′ and the forming-plate E constructed and combined as shown and described in the Liddell patent?

A. I believe it has all the parts referred to with the exception of the spring F′, said spring being unnecessary by reason of the weight of the arms and the parts they carry.

X Q. 74. Who delineated on paper the paths of the cams A A′ for the Liddell model?

A. I do not know from positive knowledge, but I suppose Mr. Ward did so if he delineated them on paper at all, which was unnecessary.

Q. 75. It is true, is it not, that the swing of the forming-plate E is about ninety degrees from the first position to the last position of that plate as shown in Figure 1 of the Liddell patent?

A. Where does counsel find the last position shown in Fig. 1 of the Liddell patent?

X Q. 76. I call your attention to the fact that the last position of that plate shown in that Figure is represented by dotted lines and circles, the circles being on the paper about a quarter of an inch below the letter F, and the lines being extended from those circles diagonally downward to the periphery of the cylinder C; and that those dotted circles represent the position that will be occupied by the hub of the axis e of the plate N when the arm F has been raised far enough to allow the edge W of the plate to pass along the periphery of the cylinder under the lower end of the arm F and when that arm has been lowered thereafter a little to carry the edge W of the plate N along with the receding line lengthwise of the periphery of the cylinder opposite to which the edge W should work?

A. I am perfectly familiar with the dotted lines referred to by counsel, but I find nothing in the patent stating that these dotted lines represent the "last position" of the forming-plate E, and,
103 before assenting by silence or otherwise to the declaration of counsel that these dotted lines do represent the last position of the plate, I ask where counsel finds authority for his statement that said dotted lines represent the last position of the forming-plate in Fig. 1 of the patent. Perhaps I may have overlooked something which counsel has seen in this patent.

[*Mr. Walker responds to the request of the witness by saying that his statement was based upon inference; which inference may, however, be erroneous, and therefore Mr. Walker will drop the point and proceed to something else.*]

X Q. 77. In a machine constructed according to the Liddell patent, through how many degrees of a revolution would the plate E normally turn relatively to the floor of the room on which the machine stood?

A. I understand the question to inquire how many degrees of a circle the forming-plate will "normally" swing in the formation of a diamond on a bag-tube, starting, say, with the position shown in Fig. 3. I do not find that the patent definitely prescribes any exact limit to such swing or oscillation of the plate, while it is obvious that the extent of its swing may be varied by variation of the cams K′ and K. Taking Fig. 8 as representing the last position and Fig. 3 as representing the first position of the plate in the machine having its cam K′ so formed as to permit the position shown in dotted lines on Fig. 8 to be reached, I should think, without measurement, that in the last position of the plate E, the arms F of Fig. 3 would be depressed to, or nearly to, their starting position now shown in that figure. In that case the plate will swing about 135 degrees of a circle.

X Q. 78. It is true, is it not, that only about 22½ degrees of that swing would result from the contribution thereto of the cam K, owing to the fact that that point across the periphery of the cam K which is most remote from the axis of that cam is, upon the scale of the drawing, only three-sixteenths of an inch more remote from that axis than is the point on the periphery of that cam which is nearest that axis, and owing to the fact that that amount of ec-
104 centricity will result, through the rod *k* and the rod *k′*, in carrying the bracket which projects upward from the gear M′ only three-sixteenths of an inch to the right of the position shown in Fig. 1, which latter is the position which will be occupied by that bracket when the roller upon the end of the rod *k* is as near as it ever gets to the axis of the cam K; and owing to the fact that that movement to the right of the bracket which extends upward from the gear M′, amounts to only 22½ degrees?

[*The question is objected to for several reasons, in the first place, the description of mechanism and statement of the functions thereof is not worded in such a manner as to be clearly intelligible, and it is considered very doubtful whether the witness or any expert witness*

could obtain therefrom the ideas which counsel is endeavoring to convey. Furthermore, Fig. 1 of the patent is treated as though it were a working drawing which it does not purport to be. Moreover, the patentee is not confined to the mechanism shown for producing an oscillation of the forming-plate.]

A. Speaking with reference to the merely illustrative drawing of Fig. 1, that may, or may not be true. I have not made the measurements of this particular figure of the drawing which counsel has done, but I am willing to assume that he has made the measurements correctly. In the question no reference is made to the relative sizes or the relative numbers of teeth in certain wheels, especially the wheel N and the rack wheel M′, which need to be taken into account. Wheels N and M′ are in this merely illustrative drawing apparently about of the same diameter, which would favor the conclusion indicated in the question. It is to be understood that the patent does not pretend that these drawings indicate an exact construction of the details necessary to produce the contemplated results and this fact is indicated in the specification, which does not define the dimensions or proportions of any of the parts, but simply says, line 91, page 1:

"Spur-gears M′ M N operate the axis *e* of the forming-plate E when the arm F is moved. Of these gears M′ is substantially
105 fixed, and hence when the arm F is moved its gears M work upon gear M′ as if it were a rack. This causes motion of plate E about *E* as an axis.

"As the motion of the arm F is irregular and not always in the same direction or one continuous movement of the former-plate E, I cause the gear M′ to be moved somewhat to compensate for this. On the shaft L, I arrange (for this purpose) a cam K, which acts upon the rod *k* to reciprocate it, and this by link k^2 rocks the gear or rack M′."

Not a word here about the contour of the cams K and K′, or the relative diameters of the wheel or the range of motion of the compensating rod k^2, or the extent of its modifying effect upon the swing of the plate E. These matters are to be determined by the constructor, embodying the principle of the device illustrated in the drawing or, dropping these particular devices altogether, and employing any others he may prefer under the provision of the specification found at line 6 of page 2 that:

"In place of these devices for controlling the plate E relative to the cylinder C, the said plate may be moved or operated by any other suitable means."

X Q. 79. I take the ground that the particular mechanism shown in the Liddell patent for operating the forming-plate E can never operate that forming-plate so as to enable it to co-operate to perform the function which the machine purports to be adapted to perform, and that, therefore, the particular Liddell machine shown and described in the Liddell patent is destitute of utility. Now, I inquire of you whether you are willing to join me in a candid analysis of exactly what is shown and described in the Liddell patent with a

view to ascertaining whether I am right or am wrong in the opinion which I have reached after a very careful analysis of my own, that the particular mechanism shown in the Liddell patent for operating the forming-plate E can never operate that forming-plate so as to enable it to co-operate to perform the function which the machine purports to be adapted to perform? If you answer this ques-
106 tion in the affirmative, I will then proceed to the analysis with you, but if you answer it in the negative, I will then put another inquiry to you on another branch of the case?

[*The question is objected to. The question consists merely of an ingenious argument by defendant's counsel coupled with an entirely irrelevant query as to whether the witness is willing to join him in an analysis of the Liddell patent to see whether defendant's counsel has formed a correct or an erroneous opinion of the same. It is entirely immaterial in this examination what opinion defendant's counsel holds of the patent in suit.*]

A. I understand that I am asked if I am willing to join counsel for defendant in an analysis of what is *exactly shown* in the Liddell patent drawings and describe in the Liddell patent specification to verify counsel's independent analysis of these matters, especially with reference to the particular mechanism shown in the Liddell patent for operating the forming-plate. I, of course, cannot decline to enter into any analysis which I may be called upon by counsel to make. But I can perhaps relieve his anxiety by stating that the forming-plate operating-mechanism of the Liddell patent has been embodied in the model referred to above, and that said forming-plate *is* successfully operated in said model by the devices of the Liddell patent so as to "perform the function which the machine purports to be adapted to perform" in said patent. I make this statement in the expectation that said model will appear in the rebuttal record of this case, wherein I expect to be called, so that I may then be confronted with this above allegation. If counsel will, therefore, only wait reasonably, very much time will be saved and I trust he will conclude to do so in view of the above allegation and save the time of all concerned.

X Q. 80. I expect when, if ever, the Liddell model is shown, to find that the forming-plate operating-mechanism embodied therein is substantially different from the mechanism for operating the forming-plate which is shown in the drawings of the Liddell patent, and that the differences which will then be apparent will include wide differences in the cams K and K' and wide differences in the gears M' and N, or one of them, and I expect that if I am
107 ever able to induce counsel for the complainant to show the Liddell model, and permit the witnesses to tell the truth about it, I shall be able to prove that the mechanism in that model for working the forming-plate was contrived by Mr. Dayton or by Mr. Ward, within the last six months, without any assistance from Mr. Liddell. But I fear that I shall never be permitted to see the Liddell model, and therefore I ask you to state whether the cams K and K' of Fig. 1 of the Liddell patent are copied on that model, and

whether all the other parts of the mechanism shown in Fig. 1 of the Liddell patent for operating the forming-plate E are copied on that model without any changes or improvements?

[*The attention of the Court is called to the gross and improper use of the complainant's record which is being made by defendant's counsel. The last question not only contains matter relating to counsel's opinions and prejudices, but also contains a wholly unwarranted attack upon the character of both counsel and witness.*]

A. If the words "without any changes" near the end of the question refer to changes in the proportions of the gears, or the precise contours of the cams, I reply, that I am unable to state, not having directly compared said gears and cams with Fig. 1 of the Liddell patent.

X Q. 81. I will venture to tell you without seeing the Liddell model how you and Ward changed the mechanism shown in Fig. 1 of the Liddell patent in order to make the forming-plate E come anywhere near performing the function ascribed to it in the Liddell patent, and then I will ask you whether my conjecture is not correct. You made a cam K′ of very different shape from the cam K′ of the drawings of the Liddell patent, and having decidedly greater eccentricity; and you made a cam K of about the same shape as the drawing of the Liddell patent, but you more than doubled the eccentricity of that cam; or, if you did not fully double the eccentricity of that cam, then you made the diameter of the gear M very much smaller than the gear M′ instead of *of* the same diameter as shown in the drawings of the Liddell patent. Now, please to state
108 whether these conjectures of mine are not in accordance with the facts as they exist in the Liddell model?

A. I am unable to say whether the conjectures of defendant's counsel are correct or not without another inspection of the model, which is denied me. I am pleased to observe, however, that the necessary formal changes, specified by counsel as sufficient to give the desired operation, are so obvious.

X Q. 82. Do you think that my conjecture included the statement that the changes it specified were sufficient to give the desired operation in my opinion?

A. That was the impression which I obtained from the introduction of X Q. 81.

X Q. 83. Do you think that the fact, if it be a fact, that I, after nearly twenty years of experience in analyzing and describing paper bag machinery, can contrive such changes in the Liddell patent as would make the machine of that patent work, shows that these changes are obvious to anybody?

A. That fact shows that they are obvious to one skilled in the art, and it is to those skilled in the art that patents are addressed. It appears to me, however, that the changes suggested by defendant's counsel in X Q. 81 are not in the nature of "contrivances," but are in the nature of the mere working out of the details of the gears and cams which any mechanic skilled in the construction of cams and

gears could do, and naturally would do in the construction of a machine in accordance with the Liddell patent.

X Q. 84. Now, it is geometrically demonstrable upon the face of the Liddell patent by anybody who is acquainted with the application of mathematics to mechanics that the exact mechanism shown in Fig. 1 of the Liddell patent for working the forming-plate cannot, by any possibility, so perform that function as that the forming-plate itself can perform any useful function in the machine. Now, assuming that you are acquainted with the application of geometry and other mathematics to mechanics, and assuming that if you were to apply those sciences to the drawing of the Liddell patent, you would find what I say to be true, how would you account for the fact that Mr. Liddell went so far astray in delineating mechanism

109 to work his forming-plate instead of showing some mechanism that was really adapted to that purpose without any extensive change.

[The question is objected to for the reason that it pretends to set forth as facts matters which have existence only in the mind of defendant's counsel. The question contains nothing which has been brought out either in the direct or cross-examination, and contains absolutely nothing upon which the witness can base an answer. It is merely another attempt of defendant's counsel to work in argument upon complainant's record, and can hardly be called even a pretense for a question.]

A. As it seems to me, the utmost that Mr. Liddell is really charged with in the question is that he made ordinary Patent Office drawings to accompany his application for a patent, instead of making working drawings for that purpose. It by no means follows that he has "gone astray" or failed to show mechanism really adapted to his purpose without extensive changes. I am, of course, unable to say why Liddell did not make working drawings, or did not make more precisely exact drawings representing the principle of his construction. There is a sufficient excuse for his not doing so in the fact that that is not usually done. I believe and know that Mr. Liddell has shown mechanism for working his forming-plate which is adapted to that purpose without any extensive change, and counsel will find so when, at the pleasure of Complainant's counsel, the model of the Liddell patent is put in evidence, or produced.

X Q. 85. I am not asking why Mr. Liddell did not make working drawings for his patent, and I am not asking why he did not make more precisely exact drawings for his patent, for I know that working drawings would be inappropriate and that the drawings that he did make are precisely exact. Please to assume that it turns out hereafter that the Liddell drawings, though precisely exact, are grossly misleading and widely different from what they must be in order to be correct, and on that assumption, please to state how you would account for that fact?

110 A. I would not account for it, or feel called upon to do so.

X Q. 86. Would your failure to account for it be due to your unwillingness, or to your inability?

A. If such a state of things existed I might be unable to account for it.

[*Adjourned to Saturday, June 14, 1902, at 10:30 A. M.*]

NEW YORK, *June* 14, 1902.

[*Met pursuant to adjournment.*]

Present: Counsel as before.

MELVILLE E. DAYTON, resumes:

[Cross-examination continued by Mr. WALKER:]

X Q. 87. In the Liddell model is the gear M′ fixed, or practically fixed, on the one hand, or, on the other hand does it rotate or rock?

A. Both, as in the Liddell patent.

X Q. 88. How can a gear be a fixed gear and also be a rocking or rotating gear?

A. Easy enough. It may be held from rotation a part of the time and permitted to rotarily rock or oscillate another part of the time; and it can act in the nature of a rack both while it is actually or practically stationary and when it is rocking or oscillating. This is made very plain by the Liddell patent.

X Q. 89. Please to confine your answers to the Liddell model when the questions are confined to that model, and first state by what means the gear M′ of the Liddell model is held stationary at the times when it is thus fixed?

A. The opening remark or injunction laid upon me in the last question implies that I had not confined my answers to the Liddell model when questioned concerning it solely. I call *teh* Court's attention to the fact that X Q. 88 made no reference whatever to the model, but was a general question in mechanics, which I answered properly.

111 Answering the question now asking about the model, I reply that the rack wheel of the model answering to the rack wheel M′ of the Liddell patent is held practically stationary, while so held at all, by the means shown in the Liddell patent for so holding the rack wheel M′.

X Q. 90. What are those means in the Liddell patent?

A. First, the rack wheel M′ in the Liddell patent is free on the shaft *f*. Secondly, it is not in any way geared with the wheel M^2 or with the cylinder M^3, but, so long as the arms FF are allowed to remain stationary, is free from all connection with any agency tending to rotate it. But if the arms FF be lifted and the wheels NMM be held against rotation, either by their friction, or otherwise, and either wholly or in part, there will obviously be a corresponding tendency to rotate the wheel M′ as though it were fast to the adjacent arm F. But it is desired that the wheels NMM shall not remain stationary or non-rotating in the swinging of the arms, and that, on the other hand, said wheels shall be made to rotate by their engagement with the rack-wheel M′. Hence, it will not do to leave the

rack-wheel M′ free to be turned on its axis by the wheels NMM, and, in order to prevent the rack wheel M′ from rotating, and in order to enable it to impart motion to the wheels NMM and to the forming-plate connected with N, said rack-wheel M′ has an arm bolted to it which is seen in Fig. 1 as projecting from the top of the wheel into connection with a link k^2. This link k^2 connects pivotally to the outer end of a sliding rod k, the inner end of which is provided with a little roller that bears against the edge of the cam K. Through these connections the wheel M′ is restrained as to its rotation in the same manner as it would be restrained if a man took hold of and held, more or less steadily, the upwardly projecting arm that is bolted to said wheel and to which the link k^2 connects. In other words, the link k^2 may be understood as representing, in principle, the arm and hand of a man holding a rigid arm projecting from the wheel M′.

All this is practically set forth on page 1 of the Liddell patent at line 89, *et seq.* to line 3, page 2.

112 If the cam K have any concentric portion, while such concentric portion is in action on the sliding rod k there will be absolutely no rotation whatever of the rack-wheel M′, but where said cam varies from the concentric, there will be a corresponding rotary movement of the rack-wheel. If, under any of the forces at any time operating upon the rack-wheel M′, it should be necessary to hold the sliding rod k inward to the path of the cam K the cam will have the usual second wall (bringing the roller on the rod into a groove) or the other, and equally familiar device of a contractile spring like that shown at F″, that may be applied to thus hold the inner end of the rod k to its proper path. The dotted lines indicating the cam K show the position and general form of the cam, and its actual form, whether to be made of the box variety or the equivalent edge variety with a ring, will be determined by the constructor.

X Q. 91. The first paragraph of your answer to X Q. 90 shows the means in the Liddell patent for holding the gear M′ against motion in an anti-clockwise direction; but that paragraph contains nothing to indicate by what means the Liddell patent shows how that gear is held from motion in a clockwise direction. The last paragraph of your answer sets forth your views as to how that gear might be held against motion in a clockwise direction; and other mechanical engineers might presumably contrive other means for accomplishing that result, but that is not the present question. Please, therefore, to state what, if anything is shown in the drawings of the Liddell patent or mentioned in the specification thereof to prevent motion in a clockwise direction of the gear M′ of Figure 1 of that patent?

A. The Liddell patent shows, at K in Fig. 1, all that is necessary to indicate and fully disclose to a mechanic a proper cam for the purpose set forth in the specification. It is, in fact, *a technical representation of any proper cam*, it being usual, even in the making of working drawings, to show the cam simply in its proper place, either by dotted lines or otherwise, and without any reference to exact contour or details of construction, since the constructor understands

from the technical indication or delineation what he is re-
113 quired to make. And he usually makes the cam, not from any drawing whatever, but by puttting a plate or similar device in place of the cam and carrying the parts of the machine through enough of its motions to enable him to trace or scribe the outline of the cam through the mechanism itself. The dotted cam K of Fig. 1 of the Liddell patent, therefore, shows to a mechanic everything necessary to his understanding of all the requirements of said cam.

[*Mr. Walker objects to this answer as being elaborately evasive, and as being deliberately irresponsive to the question.*]

X Q. 92. It is true, is it not, that the cam K shown in Fig. 1 of the drawings of the Liddell patent is an edge cam and is not a box cam?

A. The single dotted line which indicates the cam K would, of course, show only the edge against which the roller on the sliding rod K will bear inwardly, and it may be taken as showing an edge-cam. If only an edge-cam is called for in practice, such an edge-cam will be made and will comply with the drawing of the patent. On the other hand, if a box-cam (a cam which has an outer wall for the roller to bear upon on the side opposite from the dotted line shown) is actually required, what is shown in the drawing at K equally indicated a box-cam. Or, as a familiar mechanical equivalent of the outer wall, the cam may be made literally an edge-cam and a contractile spring employed, such as shown at F′ in the same Fig. 1 as holding the arm F′ against the edge-cam K′. In other words, this very figure of the drawing shows an edge-cam K′ against which an arm F′ (connected with a shaft carrying the arms F F) is held forcibly by a spring, also marked F′. The actual indication at K may be regarded as being that of an edge-cam, and the implication follows that, if necessary to hold the part controlled by the cam against said edge-cam, a spring may be employed for that purpose. I have no disposition to evade anything in this inquiry, but it seems to me I am entitled to point out the actual mechanisms involved in the drawing about which I am questioned.

[*Mr. Walker objects to the last answer because it does not state whether the cam K is an edge-cam or a box-cam; and because*
114 *it does go into an elaborate argument to show that under varying circumstances a mechanic would vary more or less from the drawings of the Liddell patent, which argument is essentially evasive of the question.*]

X Q. 93. Now, please to withhold all argument or inference for the present, and state plainly and unequivocally whether the cam K shown in Figure 1 of the Lidell patent is an edge-came and is not a box-cam?

[*Counsel for complainant objects to this question in that it has already been fully answered, the witness's last answers being in no way evasive, but direct and to the point. Counsel also objects to defendant's counsel attempting to dictate to the witness the form in which his answers are to be made.*]

A. Unequivocally it is either, technically considered. Literally, and to the eye of a man not a mechanic, it is an edge-cam.

X Q. 94. Figure 1 of the Liddell patent shows in a dotted circuit indicated by the letter K the edge of an edge-cam, does it not, and shows a roller at the end of the rod *k* entirely outside that edge of the edge-cam, and does not show any wall outside of the roller such as would be required to indicate a box-cam. Now, please to answer this exact question, and I will follow it up by inquiries into the differences between edge-cams and box-cams?

A. The dotted line referred to in the question as being present at K of Fig. 1 of the Liddell patent drawing literally shows an edge of a cam outside which is the roller at the end of the rod *k* which bears inwardly against or is borne outwardly by said edge of the cam. Said figure of the drawing does not show by lines any wall outside the roller such as would be required in a full, literal and complete graphic box-cam.

X Q. 95. It is true, is it not, that edge-cams will sometimes work in a machine where a box cam would not work, and it is also true, is it not, that a box-cam would work in a machine where an edge-cam would not work, though the configuration and eccentricity of the two cams were identical?

115 A. I do not know that it is. I am of the opinion that that is not true. But this I mean that I see no reason why in any case a box-cam may not be placed in the place of an edge-cam and *vice versa*. As to whether either will do the duty of the other, that is quite another question. In some cases an edge-cam is all that is required because only the action of the cam wall represented by the edge of the cam is all that is needed. In other cases the part to be moved or controlled by the cam requires to be acted upon in both directions, or, in other words, by an outer wall as well as an inner wall—part of a revolution by one wall and another part by the other. Sometimes the mere question of speed determines whether the box-cam shall be used instead of an edge-cam, or not. Where the gravity pressure of a part controlled by a cam is inward toward the axis of the cam, if the speed be slow enough for gravity to act in time, the edge-cam will serve, but if the speed be greater so that the gravity has insufficient time in which to preserve contact with the edge of the cam, the box form of the cam will be employed instead of the edge-cam. Or, instead of a box-cam, a spring holding the parts to the edge-cam may do in some cases. The spring has its limitations and the box form of cam does what the spring does, but more positively and reliably in some cases. All this is a matter of pure and simple mechanical judgment on the part of the constructor.

X Q. 96. It is true, is it not, that a box-cam will sometimes work in a machine to accomplish results which an edge-cam without a spring could not accomplish, though the configuration and eccentricity of the two cams were identical?

A. I have just explained that that is true as to the performance of the duty of the cam. When the part must be moved forcibly both ways by other means than gravity, and a spring is prohibited, as in the question, the box-cam will be necessary.

X Q. 97. In the Liddell model, is the cam which was made to occupy the place of the cam K of the Liddell patent an edge cam without a spring, or is it an edge cam with a spring, or is it a box-cam?

A. It is an edge-cam with a spring.

X Q. 98. In the Liddell model, is the cam which is put in
116 the place of the cam K′ of the Liddell patent an edge-cam without a spring, or an edge-cam with a spring, or a box-cam?

A. It is an edge cam, and the spring F′ shown in Fig. 1 of the Liddell patent is omitted because it is found that the gravity or weight of the arms and the parts attached thereto render such spring superfluous and unnecessary.

X Q. 99. How is a mechanic to learn from the Liddell patent whether the gear M′ is fixed to the shaft *f* on the one hand, or whether it is to be loose on that shaft on the other hand?

A. First, he will see that in the natural arrangement of the parts the arms F F should be fast to the shaft *f* and, in order that cam arm F′ may control said arms, both somewhat remote from the arm F′, said arm F′ should also be fast to the shaft *f*. If the arms F′ are fastened to the shaft the rack wheel M′ must be loose thereon.

X Q. 100. In the Liddell model, what are the respective proportions of the gears which are in the places of the gears M′ and N of the Liddell patent?

A. I have not measured them or compared them, but my recollection is that they are of about the same diameter.

X Q. 101. Does the Liddell model have two intermediate gears in the places of the gears M M of the Liddell patent?

A. It has, I believe; it must have to give the desired result.

X Q. 102. Are those intermediate gears of the same size or different sizes?

A. I don't know; it makes no difference; they are merely idlers. They are probably of the same size, for convenience and cheapness.

X Q. 103. When the Liddell model was first used by putting the forming-plate E and the parts which move it through their motion, did the eyes E^2 hit, or did they miss the projections A′

A. I don't know, I didn't see it put through its first motions.

X Q. 104. Does that model have the eyes E^2 and the projections A′ shown in the Liddell patent?

A. It has, quite unnecessarily.

X Q. 105. When the Liddell model was originally planned, what provision was made to take up "back lash" in the train of joints extending all the way from the cams K and K′ to the edge W
117 of the forming-plate?

A. I don't know, and I do not know whether or not there was any special back lash or lost motion in the train referred to. I was not present.

X Q. 106. Do you know whether there is any back lash or lost motion in that train in that model now?

A. I can't say positively; it is quite probable there is a slight lost motion or back lash.

X Q. 107. How much back lash could be tolerated in that train

and still have the edge W of the forming-plate move with sufficient accuracy to make paper bags good enough to sell?

A. Obviously I am unable to say without trial.

X Q. 108. It is true, is it not, that none of the diamond blanks that have been formed under the Liddell model have ever been completed in the paper bags by machinery?

A. I think that is true. The model does not contain the additional machinery requisite to form and fold the "flaps" and paste them. It is merely an illustrative model of the diamond-forming and blank-carrying mechanisms of the Liddell patent.

X Q. 109. My experience of nearly twenty years in this particular art of making exactly the same form of paper bags that the Liddell patent purports to show one step in making, has led me to the opinion that the back lash in so loosely jointed and numerously jointed contrivances as that shown in the Liddell patent for working the forming-plate E, must always be so great as alone to render that contrivance useless for making paper bags good enough to sell; because that experience has shown me that the edge of the forming-plate must not deviate more than a very small fraction of an inch from its ideal path; and that if a deviation of more than a small fraction of an inch occurs *form* the *ideal* path of the edge W of the forming-plate, the resulting blank of Figure 8 of the Liddell patent will be so imperfect that a salable bag cannot be produced by further operations upon that blank. Now it is possible that I have made some error of calculation in arriving at the conclusion that the back lash of such a contrivance as that of the Liddell patent must always and
118 necessarily be so great as to render that contrivance useless in the business of making paper bags to sell, though it might be used at a low speed, by hand, to fold up a few diamond blanks having some similiarity to the blank of Figure 8 of the Liddell patent. Therefore, I ask you whether you have given any attention to this subject, either experimentally or theoretically, and are prepared to corroborate or are prepared to contravene the conclusion to which I have theoretically been carried?

[*The question is objected to on account of the irrelevant statements in regard to the experience, opinions and prejudices of defendant's counsel, and on account of the question being in the nature of an argument.*]

A. I have not given so much attention to the subject referred to in the question as to enable me to state conclusively any opinion thereon.

MELVILLE E. DAYTON.

[*Cross-examination closed.*]

[*Adjourned to Monday, June 16, 1902, at 11 A. M.*]

NEW YORK, *June* 16, 1902.

[*Met pursuant to adjournment.*]

Present: Counsel as before.

[*It is hereby stipulated that the following letters were written and mailed at their respective dates on October 4th and October 8th, 1901,*

to the Continental Paper Bag Company, at its office, 61 and 63 Varick Street, New York; and that those letters were duly received by the Continental Paper Bag Company on October 5th and October 9th, 1901, respectively; and that a copy of said letter of October 4th, 1901, was on October 5th, 1901, sent to the Continental Paper Bag Company at Rumford Falls, Maine and was duly received by that company at Rumford Falls on October 6th or 7th, 1901.]

119 "NEW YORK, *October 4th*, 1901.

"The Continental Paper Bag Co.

"GENTLEMEN: Our clients, the Eastern Paper Bag Company, inform us that you are using a machine which is an infringement of United States Letters Patent to William Liddell for paper bag machines 558,691, dated April 28th, 1896, and owned by the said Eastern Paper Bag Company.

"They have instructed us to inform you that if you do not immediately desist from the infringement of this patent, and pay to them such profits as you have earned, and such damages as they have sustained, by reason of said infringement, they will institute proceedings against you to restrain such infringement, and to collect such damages and profits. An immediate answer is expected.

"Yours truly,

"BETTS, BETTS, SHEFFIELD & BETTS."

NEW YORK, *October 8th*, 1901.

"The Continental Paper Bag Co., 61 Varick Street, New York.

"GENTLEMEN: The patent to William Liddell for paper bag machinesmentioned in our letter of the 4th inst., as No. 558,691, should be No. 558,969.

"Yours truly,

"BETTS, BETTS, SHEFFIELD & BETTS."

[*And it is also stipulated that a copy of the above letter of October 8, 1901, was on the same day written and sent to the Continental Paper Bag Company at Rumford Falls, Maine, and was received by that company at Rumford Falls on or about October 9.*]

[*Adjourned subject to notice to be hereafter given by complainant's counsel.*]

120 NEW YORK, *July 30th*, 1902.

[*Met pursuant to notice.*]

Present: Mr. S. R. Betts, Counsel for Complainant; Mr. Albert H. Walker, Counsel for Defendant.

CHARLES F. SMITH, called as a witness on behalf of complainant, being first duly sworn, testifies as follows:

Direct examination by Mr. BETTS:

Q. 1 What is your name, age, residence and occupation?

A. Charles F. Smith; age, 38; residence, Bridgeport, Connecticut; occupaton, expert and mechanical engineer.

Q. 2. In whose employ are you at the present time, and how long have you been with them?

A. I am in the employ of the Continental Paper Bag Company, office at corner of Varick and Laight street, New York, and works at Rumford Falls, Maine.

Q. 3. How long have you been employed by that company, and on what work?

A. I have been employed three years in designing and building automatic paper bag machines.

Q. 4. Within that period, what firms or corporations have made paper bag machines for the Continental Paper Bag Co., and which have been delivered at their Rumford Falls factory?

A. The National Manufacturing Company of Elkhart, Indiana, and the Woodward & Rogers Company of Hartford, Connecticut.

Q. 5. What period was covered by the work done by the National Manufacturing Company as stated?

A. A little over two years, beginning about November, 1899.

Q. 6. What did you personally have to do with this work on the Elkhart machines?

A. Give general instructions in the way they should be built.

Q. 7. Was there any other representative of the Continental Paper Bag Company supervised the Elkhart machine during this period?

A. There was.

121 Q. 8. Who was it?

A. C. A. Widmer.

Q. 9. Did Edward E. Claussen have any supervision of the Elkhart machines?

A. He did.

Q. 10. What did it consist of?

A. Advising and following the building of the machine.

Q. 11. Was he acting in the interest of the Continental Paper Bag Company in this?

A. He was.

Q. 12. About when were the first of these paper bag machines shipped from Elkhart to the Rumford Falls works of the Continental Paper Bag Company?

A. Some time in the fall of 1900.

Q. 13. How many machines are there at Rumford Falls which were manufactured by the National Manufacturing Company of Elkhart?

A. About fifty.

Q. 14. When did you first see any of those machines at Rumford Falls complete?

A. Last August, August, 1901.

Q. 15. Now, which of those paper bag machines designating them by size of bag made, which were manufactured by the National Manufacturing Company of Elkhart, for the Continental Paper Bag Company and shipped to the Rumford Falls factory of the latter, were most like this Complainant's Exhibit, Model of Blank Feeding and Diamond Forming parts of Continental Bag machine in respect

to the parts illustrated by the model, and more particularly the mechanism for feeding the paper tube and forming the diamond-shaped folds for the bag bottom?

A. From the 2-pound bag to the 10-pound bag.

Q. 16. State what sizes there were in all of these Elkhart machines?

A. Quarter-pound, one-half, one, one and a half, two, three, four, five, six, seven, eight and ten pounds.

Q. 17. In the parts illustrated in the model, was there any difference between these various National Manufacturing Co. bag
122 machines in the sizes from 2 pounds to 10 pounds which you have given?

A. Yes, there was a difference.

Q. 18. Well, as between these different sizes, which one was most like the model in the parts referred to?

A. They were all alike that were built at Elkhart, but none of them like the model.

Q. 19. Well, how near did these Elkhart machines come to being like the model in the parts referred to; what were the similarities and what were the differences?

A. In the model the feed rolls would not control the tube, as it has no spring pressure to regulate it, while the machines that were built in Elkhart had this feature on them. The model also has no control of the tube on the conveyor segment, which also has to be controlled by spring pressure, which the Elkhart machines were provided with. The mechanism of the tucker-plate were also different; the levers that controlled the sliding sleeve on the tucker-plate shaft were fulcrumed in a different manner on the Elkhart machines than those of the model. The gripping position of the grippers over the tucker-plate in the Elkhart machines were in a different position than those shown on the model, being farther back of the center line of the shaft, which we found necessary for the practical working position of the grippers. Also the grippers on the folding-bed were differently constructed on the Elkhart machine from the model. Those in the model are rigidly pivoted, while in the Elkhart machines they were adjustable to different sized diamond folds and the operating mechanisms were also different. They were operated by a shaft which passed through the folding-bed, and cams mounted upon the same, which controlled both of the grippers, and on the projecting end of this shaft, was fastened an arm which was operated from a cam on the stationary sleeve attached to the side frame. Also diamond fingers mounted upon the front clip yoke, which were necessary to keep the tube from tearing while the diamond-folding was done.

Q. 20. With the exception of the mechanical feature of spring pressure which has been omitted from the model, is it not a
123 fact that its feed rolls and conveyor segment act to feed and convey the paper tube in substantially the same way as the Elkhart machines referred to?

A. They are supposed to feed in the same way.

Q. 21. Was there any difference of result on the Elkhart machines

from having the levers that controlled the sliding sleeve on the tucker-plate shaft fulcrumed in a different manner than those of the model?

A. Yes, there is a difference.

Q. 22. Well, what is it, in result?

A. The result would be in the model that the grippers could not be withdrawn quickly enough to prevent tearing the diamond fold when forming, while in the Elkhart machine this was obviated by a different construction.

Q. 23. You speak of the grippers on the folding-bed in the model being rigidly pivoted; does this result in the model or a machine made in accordance with it being adapted to only one size of bag?

A. It is for only one-size of bag, but there is always a needed adjustment for the diamond fold.

Q. 24. Now, as I understand you, the arrangement in the Elkhart machines by which the grippers on the folding-bed were adjustable, allowed those Elkhart machines to make different sized bags within the limits of the adjustment; is that correct?

A. That was not the intention of the adjustment, although the same patterns were used for different-sized bags.

Q. 25. Well, what was the advantage in the Elkhart machines of having the folding-bed grippers adjustable to different-sized diamond folds?

A. In order to make a perfect diamond fold on the end of the tucked paper tube.

Q. 26. Well, simply to permit a slight adjustment of the grippers as found to be advantageous in the actual operation of making the diamond fold; is that about it?

A. Yes; also to prevent tearing of the diamond fold.

Q. 27. Was the tucker-plate of the Elkhart machines provided with a hook or finger as is that of the model?

124 A. It was.

Q. 28. How many grippers did the Elkhart machines use in connection with the tucker-plate?

A. Two.

Q. 29. And how many grippers did the Elkhart machines use in connection with the folding-bed?

A. Four.

Q. 30. You have spoken of the Elkhart machines being operated by a shaft through the folding-bed and cams mounted upon the same which controlled both the grippers; in what respect is the model different from the Elkhart machines in these matters?

A. The model is operated separately by cams mounted on the stationary sleeve each side of the rotating frame, while in the Elkhart machine it is operated from one side only, and by face-cam instead of an internal cam.

Q. 31. Is it not true that both the Elkhart machines and the model have a shaft through the folding bed?

A. No, it is not the case with the model.

Q. 32. What is the folding-bed of the model mounted on?

A. On a pivot or shaft.

Q. 33. What is the folding-bed of the Elkhart machines mounted on?

A. On a pivot or sleeve.

Q. 34. Is is not a fact that in both the Elkhart machines and the model the operation of the grippers on the folding bed is caused by cams?

A. It is.

Q. 35. Now, consider, say, the 2-pound Elkhart machine, and describe the course of the paper tube blank through the portions of that machine which correspond to what is shown by this model in the sense that they are the tube-feeding and diamond-fold-forming portions thereof?

A. The tube is fed toward the rotating frame by the feed rolls, and is received by the front clip or gripper, also the side-grippers on the folding-bed and the grippers on the tucker-plate. The folding-bed being moved inward out of the line of action of the
125 tucker-plate during its rotation of about 180 degrees, while the rotating frame is in rotation, causing the end of the tucked paper tube to be opened by the combined action of the folding-bed and the tucker-plate.

Q. 36. And does this result in the forming of the diamond fold?

A. It does, by the assistance of other mechanisms that are not in question.

Q. 37. Now, referring to the model and to the course of a paper tube through the mechanism thereof, what difference is there in the course of the paper tube blank and the way it is operated on, as you have stated it in connection with the 2-pound Elkhart machine, from what would happen in the model to the paper tube?

A. I have never seen the model operate, and doubt very much whether a diamond-folded bottom could be made by the same, or at least accurately.

Q. 38. Well, we have in evidence a paper blank in which the diamond folds have been made on the model, but I know it is easy to operate a paper bag machine and particularly a model so as not to do something; therefore I do not ask you to run a blank through this model in view of all the circumstances, but I ask you to operate the model by turning the wheel, as indeed you have already done, and by so doing inform yourself and then answer my question No. 37?

[*Mr. Walker objects to the statement in the question that there is in evidence a paper blank in which the diamond folds have been made on the model, because that statement is not inserted in the question with a view of asking the witness whether it is true or not, but only to put into the record an unsworn statement of fact made by counsel without any legitimate reason. And Mr. Walker objects to the statement in the question that counsel knows that it is easy to operate a paper bag machine and particularly a model so as not to do something; and that therefore he will not ask the witness to try the model with a view to determine whether the doubt expressed by the witness relevant to its operativeness is well founded; the ob-*

126 *jection to this statement being made because it constitutes an intimation that the witness when under oath would act in bad faith if requested to try the model for that purpose; and because that intimation is a gratuitous insult inserted in the record by the complainant's counsel, to his own witness, whose testimony shows thus far entire freedom from every indication that the witness is not an honorable and truthful gentleman who is doing the best he can to answer the questions put to him by complainant's counsel.*]

[*Mr. Walker objects to the request contained in the question to operate the model without any paper blank in it in order to ascertain how the model will work on a paper blank; because that operation cannot without a paper blank show what would happen to the paper blank if it were in the model.*]

[*Complainant's counsel states that the exhibit referred to as the paper blank in evidence is Complainant's Exhibit Blank Formed by Witness Lane, June 4th, 1902.*]

[*Defendant's counsel states that "Complainant's Exhibit Blank Formed by Witness Lane June 4th, 1902," was made in the presence of counsel on both sides by Mr. Lane on that day, but that it was not completed on the model, but was folded down into its present shape and condition by hand after it was removed from the model, as defendant's counsel particularly noticed at the time.*]

A. I couldn't tell without running a blank through the machine. By simply turning the machine would give me no information whatever.

[*Adjourned to July 31st, 1902, at 11 a. m.*]

127 NEW YORK, *July* 31, 1902.

[*Met pursuant to adjournment.*]

Present: Counsel as before.

CHARLES F. SMITH, resumes.

Direct examination continued by Mr. BETTS:

Q. 39. Referring to the model, please turn the handle so as to make the parts move, and having done so, state whether or not such operation of the machine shows you how it would operate on a paper tube fed into and run through it?

[*Objected to as calling for secondary evidence, when primary evidence which would consist in running a tucked paper tube into the model and observing the result, is available.*]

A. Well, I fail to see how it would form a diamond fold in the tucked paper tube without inserting the blank and operating upon it.

Q. 40. From what were those Elkhart paper bag machines which were made for the Continental Paper Bag Company, made in the way of plans, drawings, specifications, etc.

A. They were made from drawings furnished by the Continental Paper Bag Company.

Q. 41. Who got up those drawings, I mean originated them?
A. Partly by Edward E. Claussen and partly by myself.
Q. 42. Where were the patterns for these Elkhart machines made?
A. At Elkhart, Indiana.
Q. 43. Where are the working drawings now from which these Elkhart machines were made; I refer particularly to any drawings which show the parts we have been considering.
A. The original drawings are at the office of the Continental Paper Bag Company in this city, but would not correspond with the machines as they have been changed greatly since their construction, and no drawings have been made for the changes.
Q. 44. Were those changes on the Elkhart machines made at Rumford Falls, or before they went there?
128 A. They were made at Rumford Falls.
Q. 45. Under whose direction?
A. Mr. Fred Strasberg.
Q. 46. Why were these changes made?
A. To improve the operation of the machine?
Q. 47. Considering the machines running from two to ten pounds, were any changes made on those machines in the parts relating to the feeding of the paper tube and forming of the diamond fold, and, if so, what changes?
A. They have made numerous changes on the machines, but I am not familiar with what they have done in Rumford Falls, as I have paid no attention to that part of the work on those machines mentioned.
Q. 48. Can you mention any letters patent which were utilized or followed in getting up these Elkhart machines, particularly the sizes from two pounds to ten pounds, and referring to the tubing and diamond-fold forming parts?
A. The patent of Edward E. Claussen, No. 598,497, dated February 8th, 1898. Also that of Edward E. Claussen and George Mortson, No. 635,090, dated October 17th, 1899.
Q. 49. Can you point out to me any figures in the sheets of drawings annexed to those two patents, and which embody either actually or substantially the paper tube feeding and diamond-fold forming mechanisms which were put into the Elkhart machines we are speaking of?
A. There are several things similar to those used in building the machines at Elkhart; for instance, in the patent 598,497 to Edward E. Claussen, the rotating frame, also the swinging folding bed, the tucker-plate, and the feeding mechanism, shown in Fig. 4, sheet 3; also on Figs. 5 and 6, sheet 4; also Figs. 11, 12, 13, 14, 15 and 16, on sheet 5. On the Claussen and Mortson patent 635,090, the feeding mechanism, the diamond forming fingers mounted upon the front clip yoke, in Fig. 1, sheet 1; also Fig. 4, sheet 4, and Figs. 7, 8, 9, 10, 11, sheet 6. Also the Elkhart machine had the specific form of tucker-plate shown in Fig. 19 of the Claussen and Mortson patent, instead of the specific form of tucker-plate shown in Figs. 5, 7 and 9 of the Claussen patent; the difference between the
129 two tucker-plates consisting in the fact that the Claussen and Mortson tucker-plate, has a part in addition to the Claussen

tucker-plate, which part extends from the axis upon which the tucker-plate turns in the opposite direction from the part shown in the Claussen patent; and which additional part is provided with a hook to engage the forward end of the upper ply of a tucked paper tube.

Q. 50. Looking at the Claussen patent No. 598,497, and the Claussen and Mortson patent No. 635,090, what drawings of those patents, if any, conform to the mechanism shown in this model, Complainant's Exhibit, about which you have been testifying?

A. I don't find anything on the model that conforms to the drawings of the Claussen patent, but on the Claussen and Mortson patent the feeding mechanism on Fig. 1, sheet 1, and Figs. 18 and 19 on sheet 8 correspond with the model.

Q. 51. Well, what figures of these two patents come nearest to showing the various parts relating to feeding and diamond-fold forming which are in the Complainant's Exhibit model; take up the parts of the model referred to separately in order?

A. The feed rolls on the model correspond with the Claussen and Mortson patent, shown on Fig. 1, sheet 1; the rotating frame and folding bed shown in Fig. 14, sheet 7, and the tucker-plate, Fig. 18 and 19, sheet 8.

Q. 52. You speak of having seen these Elkhart machines at the Rumford Falls factory of the Continental Paper Bag Co., in August, 1901; how did you know they were the same machines as were made at Elkhart under your direction, as stated?

A. I don't know, but they looked the same.

Q. 53. Did you at that time see any of those machines running at the Rumford Falls factory?

A. Some of them.

Q. 54. What were they doing?

A. Making bags.

Q. 55. Were they making bags commercially and for sale?

A. They were.

Q. 56. Are you able to state about what the manufacturing
130 capacity or output of these machines was in number of bags per hour or day?

A. I am not.

Q. 57. Were those machines, as you saw them operated at Rumford Falls in August, 1901, of the same construction and operation as you saw the similar machines at the factory of the National Mfg. Co., at Elkhart, Indiana, prior to that time?

A. I couldn't say; I didn't pay a great deal of attention to them while I was there.

Q. 58. So far as you saw, did they appear to be constructed and operated the same?

A. General appearances were the same.

Q. 59. Well, so far as you noticed and saw them, they were the same, were they not?

A. As far as I could tell from passing through the factory, they were the same.

Q. 60. Are you attending here to testify under a subpœna served upon you?

A. I am.

Q. 61. Are you under a salary from the defendant, the Continental Paper Bag Co., which has been going on during the period you have attended here?

A. I suppose it has; I can't tell what they might do. I am under a salary, and I understand it has been going on while I have been attending.

[*Direct Examination closed.*]

Cross-examination by Mr. WALKER:

X Q. 62. How many days have you been engaged in testifying in this room for Mr. Betts, complainant's counsel, in this case and in the case of the same complainant against the Woodward & Rogers Company now pending in Connecticut; including to-day?

A. Six days.

131 X Q. 63. How much money has Mr. Betts or anybody else on behalf of the complainant paid you for that six days of attendance and testimony?

A. Three dollars and twenty cents.

X Q. 64. Please to look at the Claussen patent No. 598,497, applied for July 29th, 1896, and granted February 8, 1898, and referred to in your direct examination, and please to compare the combination specified in Claim 1 of that patent with your knowledge of the paper bag machine of the Continental Paper Bag Co. in its factory in Rumford Falls, Maine, and state whether Claim 1 of that patent is accurately descriptive, as far as it goes, of those Continental paper bag machines?

[*Objected to as incompetent, for the reason that the witness has not qualified as a patent expert, and is therefore unable to construe the claims of any patent.*]

[*Mr. Walker calls the attention of the Court to the fact that the direct examination has been largely devoted to comparisons between the Claussen patent 598,497 and the Continental paper bag machine, and that this question calls, not for the construction of any claim of any patent, but for a comparison between certain combinations of mechanism which are shown in the Claussen patent 588,497 and are particularly specified in one place in that patent with a view to ascertain whether the Continental paper bag machines contain or do not contain those particular combinations of mechanism.*]

[*The objection of incompetency is reiterated and the question is further objected to as immaterial for the reason that the machines in question have been shown to infringe the patent in suit quite independently of the fact that they do or do not resemble any other patent.*]

[*Mr. Walker suggests to the Court that the machines in question have not been shown to infringe the patent in suit, because the character of the machines in question has not yet been proved in this case, and because they do not infringe the patent in suit anyhow.*]

132 A. In reading over this claim, I shall say that as far as it goes it agrees with the machines in question.

X Q. 65. Please to answer the same question as applied to Claims 2, 3, 4 and 5 of the Claussen patent 598,497, by stating whether the combinations of mechanism specified in each of those claims respectively conforms or does not conform to the Continental Paper Bag machine?

[*Same objections, especially as to incompetency as it is apparent that the witness has no knowledge or understanding of the technical meaning of any patent claim.*]

A. I find in the Claim 3 that it does not agree with the Continental machines; also Claim 5 does not agree with the machine. Claims 2 and 4 substantially are the same as the Continental machine.

X Q. 66. What difference exists between the Continental machine and the combination of parts specified in Claim 3 of the Claussen patent 598,497?

[*Same objections.*]

A. In Claim 3, it says "a tucker-plate vibrating upon a trun-ion not substantially on the line of its defining edge and devices to hold the upper ply of a tucked paper tube against the face of the tucker-plate." This is not the case with the Continental Paper Bag machine.

X Q. 67. Now, please to state what difference exists between the combination of parts specified in Claim 5 of the Claussen patent No. 598,497 and the Continental Paper Bag machine?

[*Same objections.*]

A. In Claim 5 it says: "a tucker-plate vibrating upon trun-ions not substantially on the line with its defining edge and devices to hold the upper ply of a tucked paper tube against the face of the tucker-plate." This is not the case with the Continental machine.

X Q. 68. Please to examine Claim 8 of the Claussen patent 598,-497, and state whether the combination of parts specified in
133 that claim are contained in the Continental Paper Bag machine?

[*Same objections.*]

A. I find in Claim 8 it says, "the tucker-plate provided with means to hold the upper part of the tubular blank." This also is not the case with the Continental machine.

X Q. 69. Please to state whether the combination of parts specified in Claim 9 of the Claussen patent 598,497 are in the Continental Paper Bag machine in the same relations to each other that are specified in that claim?

[*Same objections.*]

A. In Claim 9 it says "the tucker-plate, trun-ioned in the uprights, and provided with side nippers, operating means to cause the tucker-plate to vibrate, and means to close the nippers on the tucker-plate." This is not so in the Continental machine.

X Q. 70. State whether the combination of parts specified in Claim 10 of the Claussen patent 598,497 are all present in the same relative arrangement in the Continental Paper Bag machine?

[*Same objections.*]

A. I find in Claim 10 it says, "the front clip and two oppositely disposed side clips arranged to swing down upon the lower part of the tubular blank and hold the same to the carrier." This is different in the Continental machine. Also in the same claim, it says "the tucker plate, trunnioned in the uprights and provided with side nippers operating means to vibrate the tucker-plate and operating means to cause the side nippers to swing down onto the tucker-plate and hold the upper part of the tubular blank." This is not the case in the Continental machine.

X Q. 71. State whether the parts specified in Claim 13 of the Claussen patent 598,497 are all present in the Continental Paper Bag machine in the same relative arrangement?

[*Same objections.*]

134 A. In Claim 13 it says, "a tucker-plate having a folding edge adapted to define the transverse folding line across the blank on the other side of the blank and provided with trun-ions, slides adapted to reciprocate on said trun-ions, nippers pivotally mounted on the slides, the annular collar surrounding the slides and operating means to carry the slides with the nippers laterally." This is not so in the Continental machine.

X Q. 72. Please to read through Claims 14, 15, 16, 17, 18, 19 and 20, of the Claussen patent 598,497, and state which, if either of those claims, agrees in all respects, as far as it goes, with the Continental Paper Bag machines.

[*Same objections. Complainant's counsel has made no effort to show infringement of the Claussen patent referred to.*]

A. I find in the claims you mention, they substantially agree with the machine except in those parts that I have already mentioned in connection with the other claims. They do not agree in every respect with the Continental Paper Bag machines.

X Q. 73. Please to state whether Claim 6 or Claim 7 of the Claussen patent 598,497 agrees in every respect, as far as it goes with the Continental Paper Bag machines, without taking pains to mention any difference.

[*Same objections.*]

A. I do not think they agree with the Continental Paper Bag machines.

X Q. 74. Am I right in understanding your testimony on this subject to be that Claims 1, 2 and 4 of the Claussen patent 598,497 do agree with the Continental Paper Bag machines in all respects, while the other seventeen claims of that patent disagree with that machine more or less, respectively?

[*Same objections, also as leading.*]

A. You are right.

X Q. 75. Now, please to look at the Claussen & Mortson patent No. 635,090, and state whether any one of its claims agrees
135 in every respect, as far as it goes, with any Continental paper Bag machine, and if you find any claim or claims that does thus agree, please to specify that claim or those claims by the number or numbers thereof?

[*Objected to as immaterial and as incompetent for the reason that the witness is unable to consider questions of infringement.*]

[*Mr. Walker explains to the Court that the purpose of this cross-examination is to assist in showing to the Court the real construction of the Continental Paper Bag machine, so far as that showing can be made with the aid of the Claussen patent and with the aid of the Claussen and Mortson patent, and with the aid of whatever other guides to correct knowledge have been presented to the witness on direct-examination.*]

[*Complainant's counsel notes that up to the present point the purpose of the cross-examination has been to attempt to show to the Court what is not the construction of the Continental Paper Bag Company's machines, and to befog the clear showing of their construction made in the direct-examination.*]

[*Mr. Walker states to the Court that in his judgment, no man in the world can learn from the direct-examination of this witness how any Continental Paper Bag machine was constructed originally, or how any Continental Paper Bag machine is constructed now; because, although the witness appears to have answered all questions put to him frankly and responsively, those questions have not been adapted to enable the witness to show how the Continental Paper Bag machines were originally constructed or how they are constructed now.*]

A. I find in the Claussen and Mortson patent No. 635,090 Claims 1, 2, 3, 4, 5, 6 and 7 agree with the Continental Paper Bag machines, and the other claims do not agree.

X Q. 76. Now, please to look at the Liddell patent No. 558,969 of April 28, 1896, and state whether the combination specified in Claim 1 of that patent agrees, as far as it goes, with any Continental Paper Bag machine?

136 [*Objected to as incompetent and as not proper cross-examination, no reference having been made in the direct-examination to said Liddell patent, which is the patent in suit.*]

A. It does not agree with any Continental Paper Bag machine.

X Q. 77. Carefully read Claim 2 of the Liddell patent No. 558,969, and state whether the combination specified in that claim ever existed in any Continental Paper Bag machine?

[*Same objections, and the attention of the Court is directed to Mr. Walker's extraordinary attempt to convert complainant's fact witness to use as defendant's expert, and to burden complainant's record with such obviously incompetent testimony.*]

A. It never existed in any Continental Paper Bag machine.

X Q. 78. Please to carefully read Claim 7 of the Liddell patent 558,969, and state whether the combination specified in that claim ever existed in any Continental Paper Bag machine?

[*Same objection.*]

A. It has never existed in any Continental Paper Bag machine.

X Q. 79. Now, Mr. Smith, is it possible for the judge who will hear this case to understand the Continental Paper Bag machines with the aid of your present deposition, as far as it has gone, and with the aid of the Claussen patent 598,497 and with the aid of the Claussen and Mortson patent 635,090, and with the aid of the Liddell patent 558,969, and with the aid of the Complainant's Model about which you have been questioned?

[*Objected to as incompetent.*]

A. I do not think that he will be able to understand those machines, with that assistance only.

[*Recess until 2:30 o'clock.*]

137 After Recess.

X Q. 80. Are you able to show anybody how any of the Continental Paper Bag machines in Rumford Falls are constructed without any assistance from any of the machines themselves and without any assistance from the drawings of the Continental Paper Bag Company from which those machines were built?

A. I am not able to show any one without the machines or drawings.

X Q. 81. Suppose some professional expert witness who goes about the country testifying in a great variety of patent cases, whether he knows anything about the particular art to which those cases belong or not, and who never saw an automatic paper bag machine in his life, should undertake to learn from your deposition as thus far given how the Continental Paper Bag machines in Rumford Falls are constructed; could he accomplish that result with any reliability?

[*Objected to as hypothetical and entirely incompetent, immaterial and irrelevant.*]

A. He could not.

X Q. 82. Do you know a young fellow of the name of Lane, who claims to have worked as a machinist for a time in the Continental Paper Bag factory in Rumford Falls?

A. I do.

X Q. 83. Did Lane have charge of any work on the Continental Paper Bag machines in Rumford Falls, or was he simply a machinist who did whatever detailed work he was told to do, and was competent to do, without having any charge of any work himself?

[*Objected to as immaterial and not proper cross-examination.*]

A. He was simply a machinest who did such detail work as he was instructed to do.

X Q. 84. Judging from your knowledge of Lane, could he go into a machine shop, however well equipped with machinery that shop might be, and superintend the construction in that shop of
138 a paper bag machine which, when done, would be a substantial duplicate of any one of the Continental Paper Bag machines in Rumford Falls?

[*Same objection, and as obviously incompetent.*]

A. I do not think that he is capable of any such performance.

X Q. 85. The Claussen patent No. 598,479 states that the machine of that patent is distinguished from all prior machines for making a square-bottom paper bag in many respects, one of which consists in the new mode of operation by means of which that machine folds the diamond form of the paper, and that that new mode of operation includes carrying both plies of the paper tube at the primary transverse folding line which is defined by the lower edge of the tucker-plate, forward under the secondary transverse folding line across the upper ply of the paper tube, instead of carrying the secondary transverse folding line backward over the primary transverse folding line; and that in this new mode of operation the carrier oscillates inward from its normal position while it is co-operating with the tucker-plate to make the primary transverse fold, and the inwardly-inclined triangular fold, during the first half of that making, and oscillates outward to its normal position while it is thus co-operating during the last half of that making. Now, please to state whether the Continental Paper Bag machines at Rumford Falls, Maine, also have that same mode of operation which is thus described in the Claussen patent No. 598,497?

[*Same objections.*]

A. They do.

X Q. 86. The Claussen patent also states that it results from this new mode of operation that all the devices which act upon the paper to make the primary transverse fold and the inwardly-inclined triangular fold, are moving forward while they are making them. Please to state whether that is also true of the Continental paper bag machines in Rumford Falls, Maine?

[*Same objections, and also as leading.*]

139 A. That is correct.

X Q. 87. The Claussen patent also states that this new result is promotive of speed and also of some of the other superiorities which characterize the machine of that patent. Now, please to state whether that new result which you say in your answer to the last question is also true of the Continental paper bag machines, is promotive of speed and also of other superiorities in those machines?

[*Objected to as not proper cross-examination.*]

A. That is also correct.

X Q. 88. Am I right in understanding that in the machine of the Claussen patent 598,497 and also in the Continental paper bag ma-

chines in Rumford Falls, Maine, that new mode of operation and its consequent merits follow from the fact that in all those machines the folding beds are oscillating carriers which move inward at intervals toward the axis of the rotating frame alternately with moving outward from that axis, instead of rotating around the axis of the rotating frame at one unvarying distance therefrom?

[*Same objection.*]

A. That is also correct.

X Q. 89. Can that new mode of operation and its consequent merits be accomplished in any machine which, like that of the Liddell patent No. 558,969, has its folding-beds on the periphery of a cylinder, and moving around the axis of that cylinder at one unvarying distance therefrom?

[*Same objection, and also as incompetent.*]

A. It could not.

[*Cross-examination closed.*]

140 Redirect examination by Mr. BE[illegible]TS:

R. D. Q. 90. Do you consider yourself an expert in the interpretation of patent claims, and what they cover?

A. I don't know as I would call myself expert, but I think I understand them thoroughly.

R. D. Q. 91. You can answer leading questions about them, can you?

[*This question is objected to because it does not explain to the witness what is meant by the term "leading questions;" that being a technical term in the law of evidence, not generally understood by plain mechanics or mechanical engineers, and the question is also objected to as incompetent because such leading questions as were put to the witness on cross-examination were properly made leading according to the law of evidence.*]

[*And Mr. Walker suggests to the Court that complainant's counsel, in producing this witness to testify to the essential character of the defendant's machine, thereby recommended him as competent to give that testimony; and that in trying to develop that testimony by showing sundry letters patent to the witness as a guide to his explanations, complainant's counsel opened the door to cross-examination by the said method.*]

[*And defendant's counsel further suggests to the Court that now that the complainant's witness has, out of his unequaled knowledge of the facts of the construction of the defendant's machines, given a deposition which abundantly shows that none of those machines conforms substantially to either of the claims of the patent in suit which are alleged to be infringed, the suit ought now to be withdrawn and further vexation of the defendant thereby ought to be omitted.*]

[*Complainant's counsel suggests that the questions of defendant's counsel on his alleged cross-examination furnished a perfect illustra-*

tion of leading questions. Complainant's counsel ventures to
141 *characterize the last paragraph of defendant's counsel's statement as without foundation and a mere waste of time.*]

A. I couldn't tell you whether I could or not.

Recross examination by Mr. WALKER.

R. X Q. 92. Am I right in understanding that your ability to answer leading questions depends upon whether you know the facts to which those questions relate?

[*Objected to as incompetent.*]

A. It depends upon knowing the facts.

[*Deposition closed.*]

[*Counsel for complainant offers in evidence a patent office copy of U. S. Letters Patent granted to Edward E. Claussen, Assignor to A. H. Walker, February 8, 1898, and applied for July 29, 1896, and numbered 598,497, and the same is marked with the title of this cause "Complainant's Exhibit No. 6, Claussen Patent No. 598,497, J. A. S., Ex'r, July 31, 1902."*]

[*Adjourned to Monday, August 4, 1902.*]

CHARLES F. SMITH.

NEW YORK, *August 18th*, 1902.

[*Met pursuant to notice.*]

Present: Samuel R. Betts, Counsel for Complainant; Albert H. Walker, Counsel for Defendant.

Deposition of Melville E. Dayton.

MELVILLE E. DAYTON, being re-called on the part of Complainant, testified as follows, in answer to questions by Mr. BETTS:

Q. 110. Since giving the testimony which you have already
142 given in this case in questions and answers Nos. 1 to 109 inclusive, testimony has been given by Charles F. Smith, called as a witness on behalf of Complainant, and comprising questions with answers Nos. 1 to 92, inclusive. Please state whether you have read and understand that testimony, and the exhibits referred to therein?

A. I have and do.

Q. 111. Please consider said testimony of Charles S. Smith in connection with the testimony you have already given herein, and in

connection with the testimony of Albert E. Lane and the exhibits referred to therein, including the exhibit "Complainant's Exhibit Model of Blank Feeding and Diamond Forming Parts of Continental Bag Machine," and state what you understand to be the mechanism for feeding the blanks and forming the diamond-shaped folds in the paper bag machines referred to by Mr. Smith as manufactured at Elkhart, Indiana, and used by the Continental Paper Bag Co. at Rumford Falls, Maine. Also, how such mechanism corresponds with that described in the testimony herein of Albert E. Lane, and how it corresponds with the model "Complainant's Exhibit No. 7" herein. Also state whether said testimony of Charles F. Smith and your consideration thereof affects in any way the testimony you have already given in this case. Give reasons for any opinions you may express?

A. I have carefully examined the testimony of the witness Smith in the various connections referred to in the question, and I understand from Mr. Smith, that the said Complainant's Exhibit Model, as explained and identified, and in some formal respects modified as to its details by Mr. Lane, to substantially represent defendant's machines made by the Elkhart Co., and I have no occasion to change my previous testimony in any respect whatever by reason of the testimony given by Mr. Smith.

Giving my reasons for the foregoing conclusions, I point especially to question and answer 19 of Mr. Smith's deposition in this case and to the thereafter following questions and answers down to question and answer 36. Properly understood, as I believe I understand them, the answers of Mr. Smith to questions 19 to 26,
143 are altogether confirmatory of Mr. Lane's deposition and of my understanding of defendant's machines derived therefrom, and consequently confirmatory of my own formal deposition relating to defendant's machines and to their substantial correspondence with the subject matter of Claims 1, 2 and 7 of Liddell Patent sued upon.

Having reference to defendant's machines made by the National Manufacturing Co. of Elkhart, Ind., and including sizes 2 to 10 pounds, and having reference also to complainant's model Exhibit question 19 asked Mr. Smith, reads as follows:

"Well, how near did these Elkhart machines come to being like the model in the parts referred to; what were the similarities and what were the differences?"

In answer to this question Mr. Smith refers to 7 separate matters. The first and second relate to the feed rolls and feed segment (or partial roll) for drawing in the blanks and delivering them upon the rotary bed of the diamond folder mechanism. He here points out that the model lacks certain springs employed in the machine in connection with such blank-feeding rolls and segment. This, of course, and obviously, is an immaterial difference, having no bearing whatever upon the subject matter of this controversy which pertains to the diamond folding mechanism exclusively.

The third matter of difference mentioned by Mr. Smith pertains to the levers which throw the sleeves that slide endwise on the shaft carying the tucker-plate. Mr. Lane had also pointed out this difference and had explained the actual arrangement of the levers in defendant's machines. I took this difference fully into account in my former deposition and pointed out clearly, as I believe, that it is a wholly immaterial one and merely mechanical and formal. It consists in making the levers referred to inclined outwardly and downwardly over the peripherally grooved cam rollers and pivoting their lower ends to projections from the side frames, the studs engaging the cam rollers being between the fixed pivots and the sleeves to be actuated, instead of arranging the levers vertically and placing their pivots between their ends as shown in the model. The changed arrangement of the fulcrums of the
144 levers may easily give the quicker retraction of the side grippers of the cylinder, as stated in Mr. Smith's answers to questions 21 and 22, without in the least changing the principle or constituting a material difference between the model and the machines.

The fourth difference specified by Mr. Smith relates to the position of the grippers on the tucker plate. He says that in the machine referred to said grippers are further back of the centre line of the shaft than they are on the model. I understand him to refer to the inclined edges of the side grippers on the tucker-plate and I also understand that this is merely a matter of practical adjustment, as indicated by Mr. Smith's statement that he found this necessary for the practical working position of the grippers. This slight difference, while perhaps improving the operation considerably, involves no essential change in construction or operation of the parts, so that in this respect, the model still correctly represents truly the grippers as related to the tucker-plate.

The fifth difference between the Elkhart machines and the model is pointed out by Mr. Smith as pertaining to the side grippers on the cylinder or folding bed. He says: "Those in the model are rigidly pivoted where, in the Elkhart machines, they were adjustable to different sized diamond folds." This same fifth matter is further referred to in questions and answers 23 to 26th inclusive. To understand what Mr. Smith here refers to it is necessary to notice that in the model the pivots upon which the side grippers of the cylinder or rotary bed vibrate are upheld by fixed lugs cast to the bed itself. The pivot is, therefore, non-adjustable in said model, or, as Mr. Smith puts it, said grippers in the model are "rigidly" pivoted. In the machines themselves they are not rigidly pivoted. That is to say, the pivot is upheld not by lugs cast to a rotary bed but by some part movable attached to the bed, giving a capability of adjusting these cylinder grippers as may be found necessary or desirable, in view of the thickness of the paper, the depth of the tuck or other conditions in practical operation of the machine by power. This difference is manifestly merely a refinement or an

145 elaboration of the essential construction shown in the model and does not constitute a material difference between the model and the machines in so far as concerns the subject-matter of this controversy.

The sixth difference pointed out by Mr. Smith pertains to the means for operating the said side clips or grippers on the cylinder or folding bed. In the machines the said grippers are said by Mr. Smith to be "operated by a shaft which passes through the folding bed, and cams mounted upon same [upon the shaft], which controlled both of the grippers, and on the projecting end of this shaft was fastened an arm which was operated from a cam on a stationary sleeve attached to the side frame." In the model it will be remembered or noted that each of these side clips is operatd by a cam, giving two cams for both clips, one at each side of the cylinder and both stationary. Mr. Lane had pointed out that only one stationary cam was employed for the operation of both these side clips and I took full note of that fact in my former deposition. I even pointed out generally one form of connection between the two clips by which they could be so operated from a single cam, referring to the Liddell patent sued upon as illustrating such a connection for a single cam operation. It appears now from Mr. Smith's statement only that a somewhat different from of connection is employed for this purpose. The single cam rocks the connecting shaft and cams on the end of the shaft so rocked vibrate the two side clips. There is nothing in this difference between the model and defendant's Elkhart machines, therefore that at all changes the essential character of the machine or that requires any modification whatever of any portion of any former deposition relating to this matter.

The seventh difference between the model and defendant's machine, referred to by Mr. Smith, pertains to certain diamond-forming fingers present in the machines and absent from the model. These are wholly outside the subject-matter of this controversy or of the claims in suit and are merely an addition to what is shown in the model, not necessary to be here considered. I referred to this particular matter (the diamond-forming fingers), in my former deposition, I believe, as being shown in the Claussen and Mortson patent, but not present in the Liddell patent sued upon.

146 In his answer to question 27 Mr. Smith admits that the tucker-plate of the Elkhart machines is provided with a hook or finger, as it is in the model, in addition to the side clips or grippers. In answer to question 28 he admits that the tucker-plate acts in connection with two side clips or grippers, as in the model. In answer to question 29 Mr. Smith says that the Elkhart machines have four grippers acting in connection with the folding bed. I understand him here to mean that it has two side grippers or clips and two front clips, making four in all. The two front clips are really a two-part clip, the two parts being movable towards and from each other to give greater or less width of gripping surface at the end of the lower fold of the tube or blank. In question and answer 31 counsel and Mr. Smith were evidently speaking of different

things, but the misunderstanding is practically corrected in the following questions and answers 32 and 33. What Mr. Smith customarily calls the "folding bed" is the inwardly and outwardly movable portion of the cylinder periphery upon which the diamond fold is formed. Counsel in his 31st question apparently referred to the entire cylinder under the name of folding bed. The cylinder or rotary-bed structure is mounted upon a shaft journaled in the side frames of the machine, in both the model and Elkhart machines. The "folding-bed" or inwardly and outwardly vibrating portion of the cylinder is admittedly pivoted at the same place and in essentially the same way in both structures.

In answer to question 34 Mr. Smith also admits that both in the Elkhart machine and in the model the operation of the grippers on the folding-bed is caused by cams.

In answer to question 35 Mr. Smith describes "the course of the paper tube blank through the portions of the Elkhart machines which correspond to what is shown by the model" as to "the tube-feeding and diamond-fold-forming portions thereof," in the following words:

"The tube is fed towards the rotating frame by the feed rolls, and is received by the front clip or gripper, also the side-grippers on the folding-bed and the grippers on the tucker-plate. The fold-
147 ing-bed being moved inward out of the line of action of the tucker-plate during its [the tucker plate's] rotation of about 180 degrees while the rotating frame is in rotation, causing the end of the tucked paper tube to be opened by the combined action of the folding-bed and the tucker-plate."

This is identically the operation of the Complainant's Model Exhibit. The construction of defendant's machines having been shown Mr. Smith to correspond essentially with the construction of the model, and the operation of the machines and model being identical, and the result of such identity of operation being the formation of the diamond-fold on the entering paper bag tube, my former testimony is, I believe, fully confirmed by that of Mr. Smith, so far as relates to a comparison between defendant's machines and said complainant's model.

The substantial identity of defendant's machines with Complainant's Model Exhibit is further established by the testimony of Mr. Smith, as it appears to me, by that portion of Mr. Smith's deposition beginning with Q. 48 and ending with the answer to Q. 51. Here Mr. Smith starts out by admitting that defendant's Elkhart machines, "particularly the sizes from 2 pounds to 10 pounds, follow the patents to Edward E. Claussen No. 598,497, and Claussen and Morison, No. 635,090, in all essential particulars—in some respects more closely following the one and in other respects the other. In his answer to Q. 49, he says the Elkhart machines are similar to the machines of the Claussen patent with respect to "the rotating "frame, also the swinging folding-bed, the tucker-plate, and the feed-"ing mechanism shown in Fig. 4, sheet 3; also in Figs. 5 and 6, "sheet 4; also Figs. 11, 12, 13, 14, 15 and 16 on sheet 5." He

further says the machines are similar to the machine of the Claussen and Mortson Patent with respect to "the feeding mechanism, "the diamond-forming fingers mounted upon the front clip yoke "in Fig. 1, sheet 1;" and elsewhere, which diamond forming fingers, however, need not be considered, because not in this controversy. He further says in the same answer, "Also the Elkhart machines "have the specific form of tucker-plate shown in Fig. 19 of the
"Claussen and Mortson Patent, instead of the specific form
148 "of tucker-plate shown in Figs. 5, 7 and 9 of the Claussen
"patent; the difference between the two tucker-plates con-"sisting in the fact that the Claussen and Mortson tucker-plate in "addition to the Claussen tucker-plate, has a part which part ex-"tends from the axis upon which the tucker plate turns, in the op-"posite direction from the part shown in the Claussen patent; and "which additional part is provided with a hook to engage the for-"ward end of the upper slide of the tucking paper tube."

The tucker-plate of the Complainant's Exhibit Model is a substantially accurate copy of that shown in Fig. 19 of the Claussen and Mortson patent. The so-called "rotating frame" or rotary cylinder of the model is substantially the same as that shown in the Claussen patent which is also substantially the same as that shown in the Claussen and Mortson patent. This similarity between the rotary beds or frames or cylinders of the two patents will be observed by comparison of Fig. 4 of the Claussen patent with Fig. 1 of the Claussen and Mortson patent. The Complainant's Exhibit Model more closely follows the drawing of the Claussen and Mortson patent than that of the Claussen patent, with respect to this "rotating frame" bed or cylinder, because the Claussen and Mortson drawing shows the notches in the rotary frame necessary to permit the return movement of the tucker-plate, which notches are omitted in the Claussen Patent drawing with the effect of rendering the machine there shown inoperative.

[*Adjourned to 10:30 to-morrow, August 19th, 1902.*]

NEW YORK, *August* 19*th*, 1902.

Met pursuant to adjournment.

Present: Counsel as before.

Mr. DAYTON continuing his answer:

The "swinging folding-bed" of the Claussen and Mortson patent
is not materially different from that of the Claussen patent
149 and neither is materially different from that of the Complain-
ant's Exhibit Model. The similarity in this respect between the patents will be most conveniently seen by comparing, say Fig. 6 of the Claussen patent drawing with Fig. 11 and 14 of the patent drawing of the Claussen and Mortson patent. In the Claussen patent this member is numbered 56 and in the Claussen and Mortson

patent it is numbered 44. It is called a "supplemental carrier" in both patents. The pivot for the so-called "supplemental carrier" or "swinging folding-bed," connecting it with the rotary frame or cylinder, is seen at 57 in the Claussen patent drawing and at 63 in the drawings of the Claussen and Mortson patent. In both cases this pivot is at the advancing end of the "supplemental carrier," and its rear end is therefore the free end thereof which moves inwardly towards the main axial shaft of the rotary cylinder as the tucker-plate swings over it in forming the main transverse crease or fold of the diamond. In all these particulars both drawings are in all essentials like the Complainant's Exhibit Model.

As to the feeding mechanism for delivering the tubular blanks to the diamond-forming cylinder and accompanying mechanism the resemblance between the model and the several patents to Claussen and Claussen and Mortson is somewhat closer to the latter than to the former, the latter having a feeding segment 38 (see Fig. 1) opposing a feed roller 37, adjacent to the rotary bed or cylinder, instead of a pair of complete rolls as shown at 32 and 36 in Fig. 4 of the Claussen patent drawing. This matter of the feed-rolls or feeding devices need not, however, be particularly considered because the feeding devices are not subjects of the claims here in suit. I nevertheless further refer to Mr. Smith's answers to Questions 50 and 51 where he says: "On the Claussen and Mortson patent the feeding "mechanism on Fig. 1, sheet 1, * * * correspond with the "model," and "the feed-rolls on the model correspond with the Claus-"sen and Mortson patent shown on Fig. 1, sheet 1."

With reference to the tucker-plate Mr. Smith identifies the model with the Claussen and Mortson patent in his answer to Question 50, where he says: "Figs. 18 and 19 on sheet 8 (of the Claussen
150 and Mortson patent, showing the tucker-plate at 82) correspond with the model." In his answer to Question 51, Mr. Smith says of the model that "the rotating frame and folding-bed" correspond with the Claussen and Mortson patent as these are shown in Fig. 14, sheet 7, and the tucker-plate, Figs. 18 and 19, sheet 8."

In view of these several answers of Mr. Smith first identifying defendant's Elkhart machines of the sizes from 2 to 10 pounds with the Claussen and the Claussen and Mortson Patents and then identifying the Complainant's Exhibit Model with these same patents, it is manifest, I think, that he identifies the model with said defendant's Elkhart machines in the same particulars. And as these particulars embrace all those involved in the claims of the Liddell patent here in suit, the model referred to furnishes a fair basis of comparison of defendant's said Elkhart machines with these Claims of the Liddell Patent.

I have only to add that had Mr. Smith given the same deposition before I testified first I should not have reached or stated any different conclusions from those already given as to the essential correspondence between said defendant's machines and the several subjects-matter of Claims 1, 2 and 7 of the Liddell Patent sued upon.

Direct Examination Closed.

Cross-examination by Mr. WALKER:

X Q. 112. As you understand the testimony of Mr. Lane, how many cams were on the Elkhart machines to work the side grippers which operate with the tucker-plate?

A. Two, responding to the two roller cams on the upper front shaft of the model.

X Q. 113. What do you understand the testimony of Mr. Smith to set forth on that point?

A. He makes no contrary statement to that of Mr. Lane, both alike recognizing the model as correct as to the number
151 of these cams and both pointing out only that the levers engaging with these two cams are differently arranged with respect to them.

X Q. 114. To what extent have you been able to reconcile the statements of Lane and the statements of Smith in respect of the character and mode of operation of the side grippers which work with the tucker-plate in the Elkhart machines?

A. Mr. Lane pointed out no difference between the side clips or grippers belonging to the tucker-plate in the model and those in the Elkhart machines and Mr. Smith also points out no difference between the clips themselves and only says that "The gripping position " of the grippers over the tucker-plate in the Elkhart machines were " in a different position than those shown in the model, being further " back of the centre line of the shaft, which we found necessary for " the practical working position of the grippers." There is no conflict between the two witnesses in this respect.

X Q. 115. Please specify the places in the deposition of Mr. Lane and also the places in the deposition of Mr. Smith which contain any intelligible account of the side grippers which work with the tucker-plate in the Elkhart machines, and any intelligible account of the mechanism which carries those side grippers toward and from each other and also toward and from the tucker-plate when they are nearest together?

A. At question 31 of Mr. Lane's deposition the complainant's Exhibit Model, was shown to the witness and he was requested to state " how it compares in construction and operation, so far as it shows " parts of a machine, with the bag machines or any of them" which the witness had seen at the Rumford Falls factory prior to October 10th, 1901. In his answer to this and other questions following it, down to the close of his direct examination, the witness pointed out general similarity and certain specific differences. None of these differences related to the side clips co-operating with the tucker-plate although his attention was directly called to the tucker-plate mechanism and he did recognize and point out differences relative to the position and arrangement of the levers for reciprocating the sleeves upon which the tucker-plate clips or grippers are mounted. This
152 was a distinct recognition of the correspondence of the model with the machines with respect to the employment of sleeves carrying the tucker-plate side clips, as it seems to me.

Mr. Smith also in effect admits that defendant's Elkhart machines have the "sliding sleeve" on the tucker-plate shaft, present in the model, for he says, in his answer to Q. 19, wherein he is asked, "How near do these Elkhart machines come to being like the model," "the levers that control the sliding sleeves on the tucker-plate shaft were fulcrumed in a different manner on the Elkhart machines than those of the model." This appears to me to amount to saying, as Lane had in effect said, that the defendant's Elkhart machines have the sliding sleeves for carrying and operating the side clips of the tucker-plate. The discrepancy between the model and the machines pointed out by Mr. Smith is the same that was pointed out by Mr. Lane, viz., in the position and support of the levers engaging with the two rotary cams and operating to slide the sleeves on the tucker-plate shaft. Neither Mr. Lane nor Mr. Smith pointed out any difference between the tucker-plate side clips of the model and those of the Elkhart machines with respect to the means by which the side clips are moved toward and from the tucker-plate, the general statement of Mr. Lane being that the model represents the machines in this respect. Both agree, as I have already pointed out, that the model corresponds with the machines in the use of sleeves sliding on the tucker-plate shaft for carrying the side grippers or clips towards and from each other.

X Q. 116. According to the testimony of Mr. Lane, how many cams operated the side grippers upon the folding bed of the Elkhart machines; and how many cams operated those side grippers according to the testimony of Mr. Smith?

A. These two witnesses agree that only a single stationary cam is employed in defendant's Elkhart machines for operating the side clips or grippers of the folding-bed.

X Q. 117. State whether, in your judgment, the notch in the surface of the rotating frame of the Claussen and Mortson machine, backward through which the tucker-plate returns after it
153 has done its work on one blank, in order that it may begin its work on the next blank, is not an obvious provision to make for the backward return of the tucker-plate?

A. It will become obvious in an actual construction of the machine or upon an exhaustive working-out of the invention to operative completeness, by which I mean that it or something will become clearly necessary where the tucker-plate shaft is made stationary and the portion of the cylinder surface upon which the diamond is formed is made inwardly movable towards the stationary shaft of the cylinder.

X Q. 118. In the Claussen Patent, 598,497, where do you find the subject of the return motion of the tucker-plate 75 attended to either in the specification or the drawings?

A. I find means shown and described in the specification for vibrating the tucker-plate, to wit, a sector 76 on the shaft of the tucker-plate, a sector 77 on the end of a lever fulcrumed between its ends at 78 and having its opposite end provided with a projection 79 en-

gaging a cam-grooved 80 in the continuously rotating gear 28, all as shown in Fig. 4, sheet 3, of the Claussen patent drawing and as described at lines 21 to 31 inclusive, page 3 of the patent specification. These mechanisms necessarily involve the return movement of the tucker-plate as well as its advancing movement. But the Patentee Claussen, evidently having not built a machine, had also, evidently, not thought so far as to see the necessity for providing room in the cylinder to allow such return movement of the tucker-plate. In no one of the numerous drawings showing the cylinder or parts thereof, therefore, does he show any gap or notch in the cylinder to permit such return movement of the tucker-plate, and nowhere in the specification does he mention its return specifically, or refer to any provision in the machine for permitting its return. This was farther than the invention had gone, apparently, at the time of applying for the Claussen patent, and the necessary notch in the similar cylinder to allow the return swing of the tucker-plate mounted upon a stationary vibratory shaft, is first shown in the later patent to the same Claussen and his co-inventor Mortson, No. 635,090.

I refer to Figs. 4, 5, 6, 8, 10, 12, 14, 16, 18, 20 and 21
154 of the Claussen patent as showing each the portion of the cylinder where the notch for the return of that tucker-plate ought to be, but without said notch, and, moreover, deliberately shown as representing a complete, full and stationary part of the cylinder by the employment of dotted lines indicating the thickness of the cylinder rim. The showing of the drawings is, therefore, in my judgment, something more than a negative one. It is not merely a failure to show a notch or notches necessary to operativeness, but is a showing, positively, of something in the place where the notches ought to be, and rendering the machine absolutely and wholly inoperative for a single turn of the cylinder. I mean by this not that the machine could not make the paper bag bottom, but that the machine could not be given a single rotation, with or without a paper bag blank being inserted therein.

X Q. 119. Is the supposed absence of a gap or notch for the return of the tucker-plate indicated in any of the drawings of the Claussen patent 598,497 on the one hand, or, on the other hand, is it true of the drawings of the Claussen patent as well as the specification of that patent, that the return of the tucker plate, instead of being attended to at all, is left to the common sense of the constructor, so far as the constructor may find it necessary to make a notch in the surface of the rotating frame or cylinder to afford room for that return?

A. The absence of a gap or notch for the return of the tucker-plate is clearly indicated in the several figures of the Claussen patent drawings referred to in my last answer, and it is also true that the Claussen patent leaves it for some one else to devise and provide some means whereby the vibratory tucker-plate may be returned to its initial position. The Claussen and Mortson patent provides one

means for this purpose, viz.: a notch in the cylinder at each point in the periphery thereof opposite which the return swing of the tucker-plate is to take place. This is the first indication that the notch affords a way out of the difficulty. Some other inventor, or Claussen together with some other inventor, might have hit upon some other means, as, for example, a retreating movement of the tucker-plate itself with respect to the vibratory shaft carrying
155 it. Claussen follows Liddell in the use of a reversing tucker-plate having two axes with the variation of making the tucker-plate shaft stationary instead of movable, as Liddell shows it, and Claussen goes so far as to provide for one swing of the tucker-plate (thus mounted on a stationary shaft) by providing an inwardly swinging section of the periphery of the rotary cylinder, opposite the tucker-plate when forming the diamond; but he does not go so far as to provide, show, describe or hint at any provision of any kind whatever by which the tucker-plate can be returned, after thus forming one diamond, to the proper position for forming the next one.

After, in the considerably later patent to Claussen and Mortson, the notches in the cylinder are provided to remedy this defect, it is perhaps easy to say that this was a common sense way of surmounting the difficulty, but it may also be said, truthfully, that until this or some other way was devised the difficulty remained, and the machine, as shown and described in the Claussen patent, was inoperative, even to the extent of being incapable of making a single revolution, with or without the introduction of a paper bag blank.

X Q. 120. Is not the following a fair statement of the facts on this subject, viz.: The Claussen patent 598,497 shows all the mechanism for making the tucker-plate operate both forward and backward and shows room in which the tucker-plate can oscillate forward (which is the only time that the tucker-plate is working) but does not show room in which the tucker-plate can oscillate backwards. However, the necessity and the location of that room is obvious to anyone who is competent to reflect upon the point; that location being just forward of the front clip 61 in Figs. 6, 8 and 10 of the drawings of the patent; so that the omission to show that notch in those figures is to be accounted for on the theory that the draftsman who made the drawings did not happen to think that a notch or recess was necessary at that place to allow the tucker-plate to pass through the backward swing for which the patent provides, though that necessity would occur to any mechanic competent to build a paper bag machine as soon as he attentively read and examined the Claussen patent 598,497?

156 A. It is hardly to be assumed, I should say, that Claussen would submit his invention to the maker of patent drawings in a fatally inoperative condition and expect the draftsman to add provisions for making it operative. Besides, however clear it might become upon elaborate investigation (such as patent office draftsmen are rarely, if ever, called upon to make) that some means for permitting the return of the tucker-plate would be necessary in an

actual machine, the notch in the cylinder is not the only nor the inevitable provision for this purpose, as I have pointed out in my last previous answer. The provision of a notch in the cylinder for this purpose, located at the point stated in the question, and at the point shown in the later patent to Claussen and Mortson, is, moreover, a possible resort only in case the cylinder is made large enough around to accommodate the notch or notches at the point or points referred to. This device, therefore, consists not simply in making a notch, but also in making a cylinder of the proper size to permit the making of a notch of the proper or necessary dimensions in the proper place.

Relative to the question of accounting for the omission of the notch in all the numerous figures of the Claussen patent drawings where it ought to have been shown, if anybody had thought of it, I will add that in my judgment such omission is to be accounted for on the theory that Claussen did not think of it, rather than "on the " theory that the draftsman who made the drawing did not happen " to think that a notch or recess was necessary at that place to allow " the tucker-plate to pass through the backward swing for which the " patent provides" in gearing but not otherwise.

X Q. 121. Please look at Fig. 4 of the Claussen 594,497 and assume that a concave recess had been shown at the location of the numeral 57 at the diametrically opposite sides of the rotating frame of Fig. 4 (which two places are the only places where the numeral 57 appears in Fig. 4 of the drawings of the patent) and assume that each of those concave recesses had been deep enough and wide enough to permit the backward oscillation of the tucker-plate passing through them, and assume the presence of such a con-
157 cave recess next above the front clip 61 in Figs. 6, 8 and 10, and also in Figs. 12, 14 and 16 of the drawings of the patent, and then state whether that concave recess would have remedied the error which was made in the drawings of the patent in not providing against a collision between the tucker plate and the rotating frame when the rotating frame is turning forward and the tucker-plate is oscillating backward, and please state whether there is not plenty of room on the surface of the rotating frame for those two concave recesses without interfering with anything else?

A. There is ample room in the full part of the cylinder at the right of the pivot 57, as shown at the top in Fig. 4 and in Figs. 6, 8, 10, 12, 14, and 16 (considered together) for the accommodation of a notch that would permit the return swing of the tucker-plate, and such a notch at this point, relative to each of the two vibratory sections of the cylinder periphery, would serve the purpose of permitting the return of the tucker-plate after each forward swing, provided the cam (shown at 80 in Fig. 4) were properly shaped to give the return swings of the tucker-plate opposite said notches.

X Q. 122. State whether, in your opinion, the absence from Figs. 4, 6, 8, 10, 12, 14 and 16 of the notch or concave recess which might have been shown in the surface of the cylinder or rotating frame

just forward of the pivot 57 of the clip 61 and which, if shown at that place would have given room for the backward oscillation of the tucker-plate without interfering with anything else, is such a defect in the Claussen patent 598,497 as derogates either from the validity or from the value of that patent, although the absence of such a notch or recess in a machine would prevent its operativeness even through one revolution of the rotating frame, on account of the collision which would occur between the rotating frame and the tucker-plate, if that notch or recess were absent?

A. I do not know that I am legally competent to answer this question, but my understanding is, generally, as follows: If the patent showed any means for permitting full operativeness of the tucker-plate (I mean, means intended to afford operativeness) a defective showing of such means would be susceptible of correction at
158 the hands of the mechanic; but if the patent fails utterly to show or describe any means whatever intended for such purpose, it is not within the province of the mechanic to furnish it. The mechanic may elaborate, perfect or improve means shown, or may substitute other means in place of that shown, but when he devises means originally where none are present in a patent, he does so as an inventor and not as a mere mechanic.

X Q. 123. In this particular case it appears, according to your testimony, that the drawings of the Claussen patent No. 598,497, are defective because if a machine were made exactly like those drawings the tucker-plate would collide with the rotating frame twice during each revolution of the latter. But it also appears according to your testimony that those collisions could be prevented by simply forming some notches or concave recesses upon the surface of the rotating frame at the two places where those collisions would occur, so as to allow the tucker-plate to pass through its path without colliding with the rotating frame; and it also appears in your testimony that there is plenty of room on the surface of the rotating frame for those two notches or concave recesses without interfering with anything else. Now, please state whether, in your judgment, the absence of those recesses from the drawings of the patent constitute such a defect in the patent as derogates either from its value or its validity?

A. In my judgment it does. The patentee has failed utterly to show such notches and to indicate that he ever thought of such notches or of any other means for permitting the return of a tucker-plate. His thought or conception seems to be, therefore, vitally incomplete. If he had shown notches which, upon accurate measurement, were found to be too shallow, for example, this would be a matter of no serious moment, in my judgment. But his utter failure to show anything intended to accomplish the purpose is, I should say, a fatal defect in the patent, derogating from its validity and value.

X Q. 124. Do you hold that the Claussen patent No. 598,497 is fatally defective as a patent because the absence of the notches or

159 concave recesses of which you have spoken must prevent a machine made exactly according to the drawings of that patent from having any utility whatever?

A. It will be for the Court to "hold" one way or the other upon that question, but it is a fact, which counsel appears to recognize, that a machine made in accordance with the Claussen patent without notches in the cylinder or other means permitting the return movement of the vibratory tucker-plate, will be wholly inoperative and incapable of a single revolution, equally whether a paper bag blank be inserted or not. I have already expressed the opinion that, the Claussen patent, showing and describing or suggesting no means for rendering the machine capable of a single revolution, is fatally defective.

X Q. 125. Suppose it turns out hereafter that a machine made exactly according to the drawings of the Liddell patent in suit No. 558,969 would also be useless for the very same reason of a collision between its forming-plate E and the revolving cylinder twice during each revolution of the cylinder, and suppose it should turn out that that fault in the Liddell machine cannot be remedied by any such simple device as making a concave recess in the surface of the cylinder at diametrically opposite points to permit the forming-plate to pass through its path, and can be remedied only, if remedied at all, by long continued and profound geometrical analysis for the purpose of contriving new means of moving the forming-plate E harmoniously with the cylinder; what then would be your opinion about whether that defect in the Liddell patent were fatal to its validity?

[*Complainant's counsel objects to the above question as hypothetical, without foundation, indefinite in its statements and not founded on the direct examination.*]

[*Mr. Walker states to the Court that this is a hypothetical question, but that the hypothesis stated therein conforms to facts which have already been established as facts and which will be proved to be facts in the course of the defendant's evidence.*]

160 A. The first supposition of the question is quite tenable, but the second, namely, that it shall turn out that the fault can be remedied only, if at all, "by long-continued and profound "geometrical analysis for the purpose of contriving new means of "moving the forming-plate E harmoniously with the cylinder," is wholly untenable and contrary to the facts, as I personally know. Answering the question, it is my opinion that the defect in drawings of the Liddell patent relative to the means for returning or operating the tucker-plate, is not fatal to the patent or at all serious, and does not in the least militate against the patent in any respect whatever. The difference between this case and that of the Claussen patent is, in my judgment, radical and vital. Liddell shows means intended for operating the tucker-plate in both its necessary movements, without collision with the cylinder, and all that is necessary at the hands of a mechanic in constructing the machine with such

means, is to practise ordinary skill and judgment in the laying out and construction of the cams shown by Liddell. In the case of the Claussen patent actuating means are indeed shown for vibrating a tucker-plate both ways, but the cylinder is shown as having provision for permitting the vibration of said tucker-plate in one way only. There is no illustration, description, suggestion or hint of any provision whatever for permitting the return vibration of said tucker-plate and there is nothing in the Clausssen patent to indicate that the invention ever thought so far as to see that some provision would be necessary to permit this return movement of the tucker-plate. If he had shown notches in the cylinder and said notches were too shallow, then the case would be like that supposed as to the Liddell patent, and it would be only left for the mechanic to perfect or practically work out something already disclosed, instead of devising originally something not disclosed or suggested in the patent.

[*Adjourned to to-morrow morning, August 20, 1902, at 10:30.*]

161 NEW YORK, *August 20th*, 1902.

[*Met pursuant to adjournment.*]

Present: Counsel as before.

Cross-examination of MR. DAYTON continued:

X Q. 126. Please answer hypothetical X Q. 125 and please leave the investigation of the truth of that hypothesis to some future occasion and please omit everything from your answer which is not called for by the question?

A. As I understand this question, it simply proposes that I shall adopt, or assume to be correct, the allegation of counsel that the fault in the Liddell patent drawing, "can be remedied only, if "remedied at all, by long-continued and profound geometrical "analysis for the purpose of contriving new means of moving the "forming-plate E harmoniously with the cylinder." Knowing the statement of counsel to be contrary to the fact, I find it impossible to make that assumption. The words "profound geometrical analysis" can hardly have reference to anything else than the mathematical calculation and laying out of the cams K and K′ of the Liddell patent, and the words "for the purpose of contriving *new means* of moving the forming-plate E" appear to indicate that the cams, after being laboriously calculated or worked out, would be "new means" or not the means proposed by Liddell in the patent specification and drawings. It is obvious, I think, that changing the shape of a cam does not make it "new means," however laboriously its perfected shape may have been reached.

However, understanding the words "new means" in the question to refer to the changed shape of the came, I repeat as my answer to the present question all my answer to the last one following the first sentence thereof.

[*Mr. Walker declines to cross-examine this witness any further, because he has twice evaded X Q. 125, and Mr. Walker objects to the whole of the deposition as inadmissible in evidence, because the witness obstinately refuses to submit himself to fair cross-examination.*]

162 [*Complainant's counsel here and now offers the witness for further cross-examination, Mr. Walker's opinion on the answers of the witness not being binding on any of the parties concerned.*]

[*Complainant's counsel states that he has no redirect-examination and requests the witness to sign his deposition.*]

MELVILLE E. DAYTON.

[*Complainant's counsel states that the prima facie case is now closed.*]

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v.
Eastern Co.

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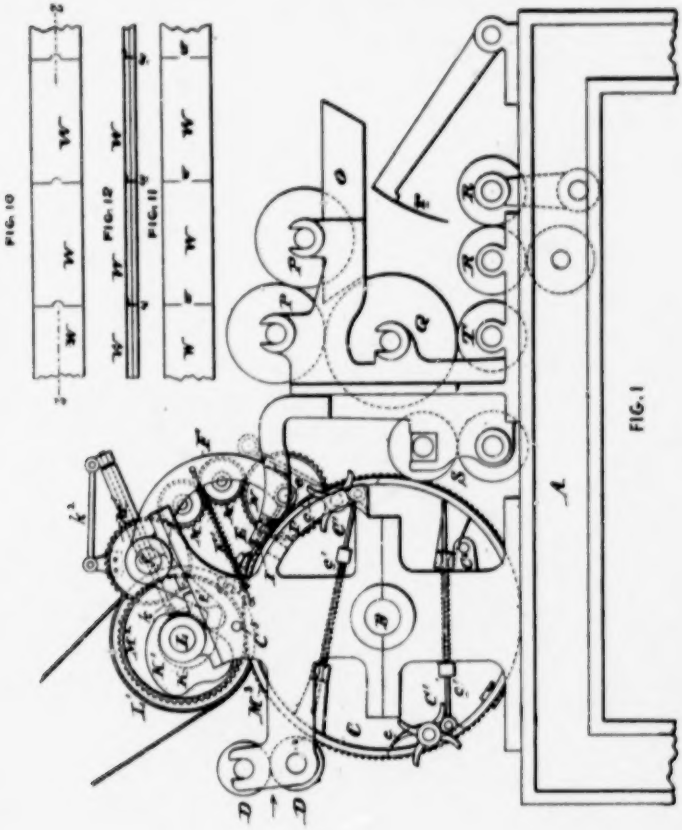
(No Model.) 3 Sheets—Sheet 1.

W. LIDDELL.

PAPER BAG MACHINE.

No. 558,969. Patented Apr. 28, 1896.



Witnesses.
Henry Dumpf
Wm. L. Evans

Inventor.
William Liddell
By Wm. Liddell & Co.
Attorney.

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Continental Co } p. 164
Eastern Co

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(No Model.) 3 Sheets—Sheet 1.

W. LIDDELL.

PAPER BAG MACHINE.

No. 558,969. Patented Apr. 28, 1896.

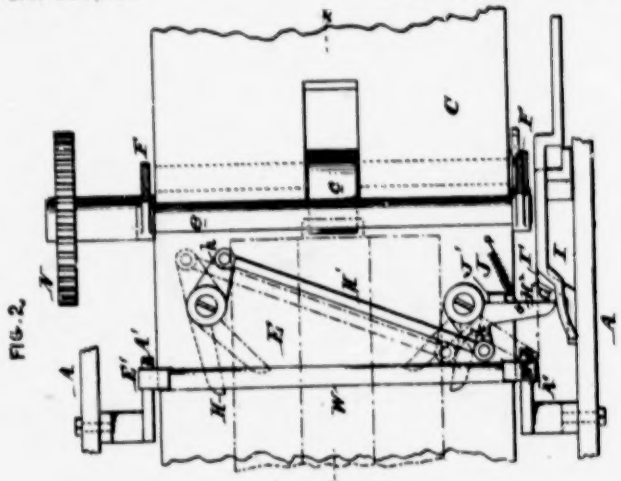

FIG. 2

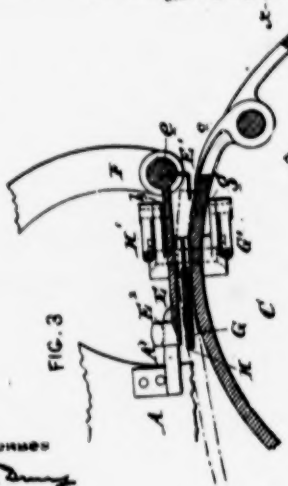

FIG. 3

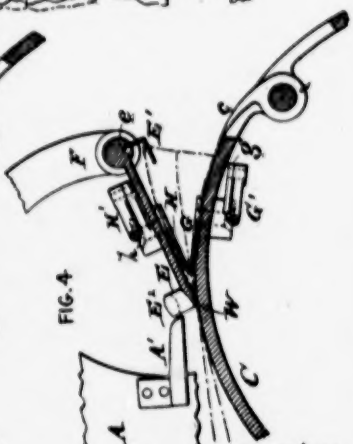

FIG. 4

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Thos. L. Evans

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Eastern Co.

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(No Model.) 3 Sheets—Sheet 3.

W. LIDDELL.

PAPER BAG MACHINE.

No. 558,969. Patented Apr. 28, 1896.

FIG. 5

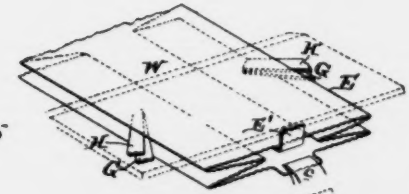


FIG. 6

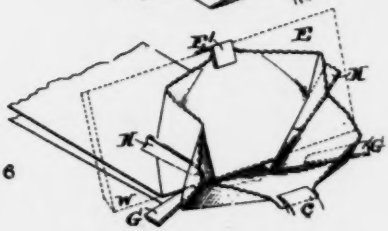


FIG. 7.

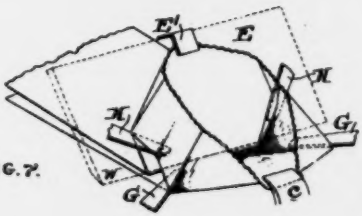
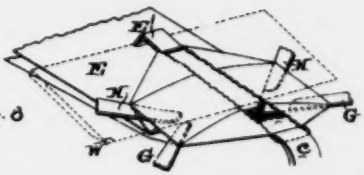


FIG. 8



Witnesses.

Wm. L. Evans

Inventor.

William Liddell

By [illegible]

Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM LIDDELL, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE EASTERN PAPER BAG COMPANY, OF CONNECTICUT.

PAPER-BAG MACHINE.

SPECIFICATION forming part of Letters Patent No. 558,969, dated April 28, 1896.

Application filed February 6, 1896. Serial No. 578,201. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM LIDDELL, of the city of Brooklyn, county of Kings, State of New York, have invented an Improvement in Paper-Bag Machines, of which the following is a specification.

My invention has reference to paper-bag machines; and it consists of certain improvements which are fully described in the following specification and are shown in the accompanying drawings, which form a part thereof.

This application comprehends certain mechanism for forming a satchel bottom upon the tube in the manufacture of paper bags, and has for its object the production of a perfectly-formed satchel-bottom bag in a speedy and accurate manner. My improvements, briefly stated, may be described as follows: The tube is received upon a revolving cylinder and carried forward by a nipper, which clamps the lower sheet of the tube, or by other means hereinafter described. The upper sheet of the tube passes above a finger upon a movable forming-plate securely held at a short distance from the revolving cylinder and between which and the cylinder the tube is guided. The forming-plate is then caused to rotate about its rear edge simultaneously with its movement or travel with the revolving cylinder, thereby opening the end of the tube, spreading the side folds, and marking a creased line transversely. Simultaneously with this forming-fingers are projected into the side folds, one pair being adapted to the cylinder and the other pair to the forming-plate. A continued movement of the parts causes the upper layer or sheet of the tube to be completely turned backward upon itself, and at the same time the forming-fingers together with the other parts insure the proper formation of the diamond fold. The tube in this shape leaves the revolving cylinder, passes to the pasting devices, and thence to the folder.

The invention will be better understood by reference to the accompanying drawings, in which—

Figure 1 is a side elevation of a paper-bag machine embodying my improvements. Fig. 2 is a plan view of a portion of the same. Figs. 3 and 4 are sectional elevations on the line *x x* of Fig. 2, showing the operations of the parts in the formation of the bottom. Figs. 5, 6, 7, and 8 are perspective views illustrating the several manipulations which take place upon the bag-tube in its formation under the action of the nipper and the forming-fingers. Fig. 9 is a diagram illustrating the employment of a continuous or connected series of tubes to insure their being fed with the cylinder and obviating the necessity of nippers. Fig. 10 is a plan view of the paper tube employed in connection with Fig. 9. Fig. 11 is an inverted plan view of same, and Fig. 12 is a longitudinal section of the tube on line *z z*.

A is the main frame of the machine.

B is a shaft carried upon the main frame and upon which is supported the forming-cylinder C, which may be provided with one or more nippers *c*, adapted to be closed and held closed by the action of the spring *c'*, and opened by the action of a pin C^3, acting upon the star-wheel C'. The nipper is also controlled as to its being closed by the action of the pin C^3, also acting upon the star-wheel. These devices operate to enable the nipper to close upon the forward edge of the under layer of the bag-tube, and after the formation or creasing of the bottom into the diamond folds to release the bag-tube.

D D are two feed or guide rollers adapted to properly deliver the bag to the cylinder C.

E is a forming-plate and is hinged at *e* to the arm F, journaled to the main frame at *f*. This arm F is drawn toward the cylinder C by a spring F', and is moved away from the cylinder about the axis *f* by cam K' and arm F².

L is a rotating power-shaft carrying cam and is driven by a belt-pulley L' and operates the cylinder C by gears $M' M^2$. Spur-gears M' M N operate the axis *e* of the forming-plate E when the arm F is moved. Of these gears M' is substantially fixed, and hence when the arm F is moved its gears M work upon gear M' as if it were a rack. This causes motion to the plate E about *e* as an axis.

As the motion of the arm F is irregular and not always in the same direction for one continuous movement of the former-plate E, I cause the gear M' to be moved somewhat to compensate for this. On the shaft L, I arrange

a cam K, which acts upon a rod k to reciprocate it, and this by link k^2 rocks the gear or rack M'. The cams K and K' insure a proper return movement of the arm F and former-plate E, and in time with the rotations of the cylinder C. In place of these devices for controlling the movement of the plate E relatively to the cylinder C the said plate may be moved or operated by any other suitable means. The return movement of the plate E is unimportant, so long as it is secured in time to receive a new bag-tube or section thereof.

The cylinder C has pivoted upon its periphery fingers G G, which are normally out of the line of the bag-tube, but which may be projected inwardly by the action of a cam I', secured to the main frame A. The fingers G G are connected together by arms g and a link G', arranged in the under side of the cylinder-surface, and one of them is further provided with an arm G^2, adapted to come in contact with the cam I' during the rotation of the cylinder and thus cause said fingers to be projected inward, as indicated in dotted lines in Fig. 2, so as to enter the bellows side folds of the tube. The former-plate E has its rear edge made sharp, as at W, so that when it presses downward upon the bag-tube it forms a transverse crease about which the paper bends, as clearly shown in Figs. 4 and 6. This former-plate E is also provided with fingers H H, corresponding to the fingers G G, which are connected by arms h and link H' precisely as are connected the fingers G G, and are operated by means of a spring J in one direction to hold them out of action, and a stationary cam I, acting upon an arm or projection H^2, to move them inward or in the other direction, so that they enter the bellows side folds precisely as at the fingers G G. Stops J' limit their movement in one direction.

The rear or free end of the former-plate E is provided with eyes E^2, which are received upon projections A', as clearly shown in Fig. 3, so as to be maintained out of the line of the bag-tube in entering between the said plate and the cylinder C after it has been caught by the nipper c and moved forward. When the bag-tube is moved to the position shown in Fig. 3, the upper layer of the paper is moved over a finger E', arranged adjacent to the axis e and below the former-plate E. As the plate E is moved forward with the bag-tube the eye E^2 leaves the projection A', as shown in Fig. 4, and the edge W presses down upon the paper, forming a line or crease. It will also be observed that as this takes place the fingers G H upon each side at their free ends are brought more or less together, and at the same time the finger E' moves away from the nipper c, opening the bellows side folds, as indicated in Fig. 4. This permits the ready entrance of the fingers G H under the action of the cams I' I, and these fingers continue to maintain their position during the successive formative actions of the machine. As the cylinder C moves forward the plate E rotates upon its own axis e and also about edge W as an axis, as indicated in Figs. 6, 7, and 8, which action is so timed that the several fingers G H, nippers g, and finger E' operate to form the several actions upon the tube substantially in the manner as indicated in Figs. 2 to 8. As this folding action is completed the fingers G H quickly fly out of the folds of the tubes when their arms G^3 H^3 lift the cams I' I, and the bag in its folded condition is still held by the nipper c and carried forward with the cylinder C. It is then delivered to the rolls S, having pins s, thence to the paste-rolls Q T, of which Q applies the paste after having received it from the rolls P P and vat O. The bottom is then folded by the knife r, which folds the paper upon itself between pressure-rolls R R. It is quite evident that the delivery, paste, and subsequent folding devices may be made in any of the well-known manners, and their particular construction is immaterial to my invention. I do not, therefore, deem it necessary to describe the minute details of these devices, but illustrate them so as to show their relative position in a machine of the class described.

When the cylinder C advances sufficiently to deliver the bag to the feed-rolls S, the star-wheel reaches the pin C^2 and opens the nipper c to release the paper bag, and the said nipper remains open until it reaches the pin C^2, which closes the nipper upon another bag-tube. I have shown two such nippers and their operating mechanism, and it is evident that so far as my improvements are concerned one or more of these devices may be employed by simply reducing or enlarging the diameter of the cylinder C, maintaining its surface speed the same.

As soon as the tube has been withdrawn from the plate E the said plate is caused to return to its original position by the operation of the arm F, cams, and gears, so that it shall be in the proper position to receive the next paper tube. As before explained, the gear M' is in effect substantially a rack, but moved by cam K, and as the arm F is oscillated about f as a center by cam K' the intermediate gear M and gear N causes a proper rotation or oscillation of the plate E about e as a center. The movement of the arm F is governed by the cam K' and arm F', and is so timed that while permitting the rotation or oscillation of the plate E about its axis e it insures the edge W moving exactly at the same speed of the surface speed of the cylinder C, so as not to displace in any manner the tube.

While I have shown the nippers upon the cylinder C, they are not necessary, as the paper tube may be severed into bag-tube sections W, Fig. 10, but left connected by short connections w, Fig. 11, so that it is in effect pulled by itself about cylinder C under the action of the rolls S'. The rollers S' may be

cutting-rolls, which while drawing the tube-section through sever the bag-tube sections before they go to the pasting devices. This method of operating is indicated in Fig. . It will be observed that as the tube is bent over the cylinder C the upper layer will rise and pass above the finger E' of the former-plate E. In this case the bag-tube will have the diamond folds made upon the tube while still connected together. It will thus be seen that it is not necessary to employ the nippers upon the cylinder C, though it may be more desirable to use them.

It is evident that the mere mechanism for securing the several movements to the different parts may be modified or changed in various ways without departing from the spirit of the invention, and I do not, therefore, confine myself to the details of construction here shown.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a paper-bag machine, the combination of a rotating cylinder provided with one or more pairs of side-folding fingers adapted to be moved toward or from each other, a forming-plate also provided with side-forming fingers adapted to be moved toward or from each other, means for operating said fingers at definite times during the formative action upon the bag-tube, operating means for the forming-plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder, the whole operating for the purpose of opening and forming the bottom of the bag-tube, and means to move the bag-tube with the cylinder.

2. In a paper-bag machine, the combination of the rotating cylinder provided with one or more pairs of side-folding fingers adapted to be moved toward or from each other, a forming-plate also provided with side-forming fingers adapted to be moved toward or from each other, means for operating said fingers at definite times during the formative action upon the bag-tube, operating means for the forming-plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder for the purpose of opening and forming the bottom of the bag-tube, a finger moving with the forming-plate for receiving the upper sheet of the tube and lifting it during the formative action, power devices for returning the forming-plate to its original position to receive a new bag-tube, and means to move the bag-tube with the cylinder.

3. In a paper-bag machine, the combination of the rotating cylinder provided with one or more pairs of side-folding fingers adapted to be moved toward or from each other, a forming-plate also provided with side-forming fingers adapted to be moved toward or from each other, means for operating said fingers at definite times during the formative action upon the bag-tube, operating means for the forming-plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder for the purpose of opening and forming the bottom of the bag-tube, a finger moving with the forming-plate for receiving the upper sheet of the tube and lifting it during the formative action, power devices for returning the forming-plate to its original position to receive a new bag-tube, means to sustain the rear of the forming-plate clear of the surface of the revolving cylinder so as to permit the proper entrance of the paper bag between the former-plate and the surface of the cylinder, and means to move the bag-tube with the cylinder.

4. In a paper-bag machine, the combination of the rotating cylinder provided with one or more pairs of side-folding fingers adapted to be moved toward or from each other, a forming-plate also provided with forming side fingers adapted to be moved toward or from each other, means for operating said fingers at definite times during the formative action upon the bag-tube, operating means for the forming-plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder for the purpose of opening and forming the bottom of the bag-tube, means to sustain the rear of the forming-plate clear of the surface of the revolving cylinder so as to permit the proper entrance of the paper bag between the former-plate and the surface of the cylinder, and means to move the bag-tube with the cylinder.

5. In a paper-bag machine, the combination of a rotating cylinder provided with one or more nippers, power devices for opening and closing the nippers at predetermined intervals of time, pivoted side-forming fingers G G carried upon the surface of the cylinder and upon each side thereof so as to receive the bag-tube between them, power devices for operating the fingers G, G at definite times during their movement forward with the cylinder, a forming-plate E also provided with side-forming fingers H H adapted to be brought into alinement above the fingers G G in the preliminary operation of forming the bag, a movable frame to which said forming-plate is hinged, power devices for moving said movable frame, power devices for oscillating the said forming-plate upon the movable frame so that its rear edge travels in conjunction with and at the same rate of speed as the cylinder, and means for operating the forming-fingers of the former-plate.

6. In a paper-bag machine, the combination of a rotating cylinder provided with one or more nippers, power devices for opening and closing the nippers at predetermined intervals of time, pivoted forming-fingers G G carried upon the surface of the cylinder and upon each side thereof so as to receive the bag-tube between them, power devices for operating

the fingers G G at definite times during their movement forward with the cylinder, a forming-plate E also provided with the forming-fingers H H adapted to be brought into alinement above the fingers G G in the preliminary operation of forming the bag and also provided with a finger rearwardly extending at its forward end for separating the upper layer of the bag-tube when opening the same during the oscillation of the plate, a movable frame to which said forming-plate is hinged, power devices for moving said movable frame, power devices for oscillating the said forming-plate upon the movable frame so that its rear edge travels in conjunction with and at the same rate of speed as the cylinder, and means for operating the forming-fingers of the forming-plate.

7. In a paper-bag machine, the combination of the rotating cylinder for the bag-tube provided with one or more pairs of folding-fingers adapted to be moved toward or from each other, a forming-plate also provided with forming-fingers adapted to be moved toward or from each other, means for operating said fingers at definite times during the formative action upon the bag-tube, operating means for the forming-plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder for the purpose of opening and forming the bottom of the bag-tube, and connecting mechanism for timing the movements of the rotating cylinder and the forming-plate.

8. In a paper-bag machine, the combination of a rotating cylinder provided with one or more nippers, power devices for opening and closing the nippers at predetermined intervals of time, pivoted forming-fingers G G carried upon the surface of the cylinder and upon each side thereof so as to receive the bag-tube between them, power devices for operating the fingers G, G at definite times during their movement forward with the cylinder, a forming-plate E also provided with forming-fingers H H adapted to be brought into alinement above the fingers G G in the preliminary operation of forming the bag, a movable frame to which said forming-plate is hinged, power devices for moving said movable frame, power devices for oscillating the said forming-plate upon the movable frame so that its rear edge travels in conjunction with and at the same rate of speed as the cylinder, means for operating the forming-fingers of the forming-plate, and connecting devices for timing the movements of the movable frame the former-plate and the rotating cylinder.

In testimony of which invention I have hereunto set my hand.

WM. LIDDELL.

Witnesses:
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ERNEST HOWARD HUNTER.

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Eastern Co.

No. 635,090. Patented Oct. 17, 1899.

E. E. CLAUSSEN & G. MORTSON.

PAPER BAG MACHINE.

(No Model.) Application filed June 17, 1899. 8 Sheets—Sheet 1.

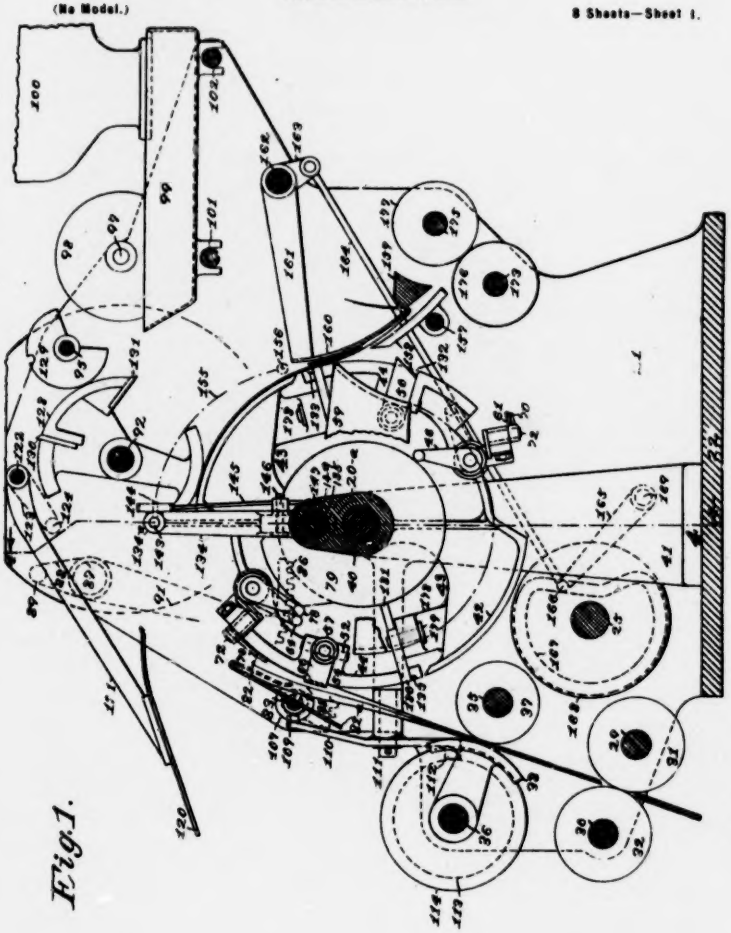

Fig. 1.

Witnesses:
J. S. Ellsmith.
C. F. Smith

Inventors:
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v.
Eastern Co.

No. 635,090. Patented Oct. 17, 1899.

E. E. CLAUSSEN & G. MORTSON.

PAPER BAG MACHINE.

(Application filed June 17, 1899.)

(No Model.) 8 Sheets—Sheet 2.

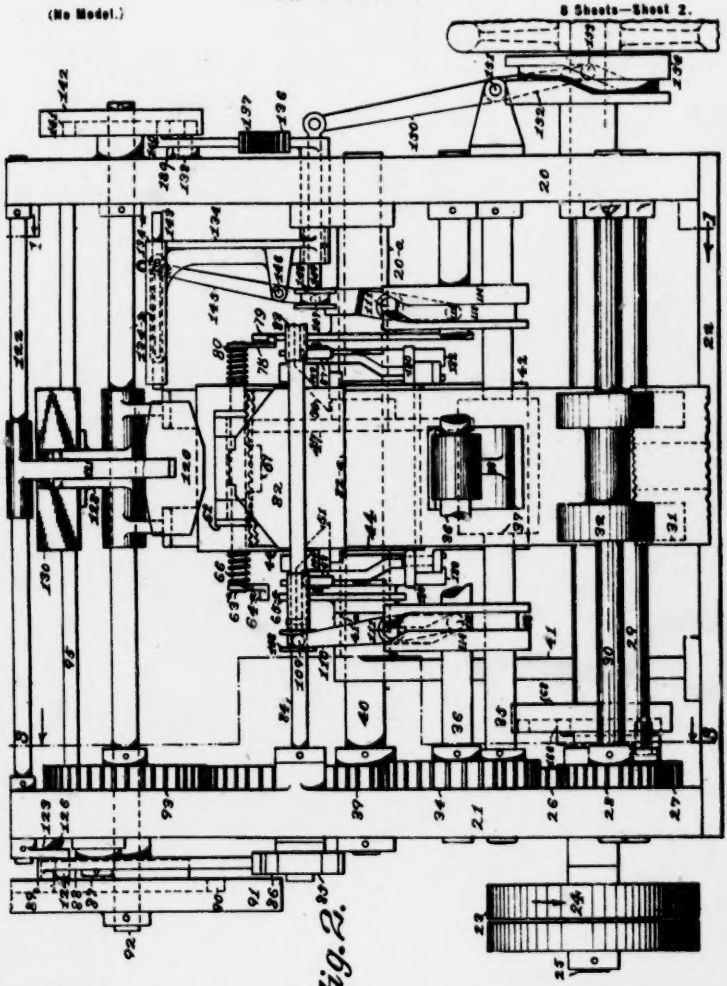

Fig. 2.

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No. 202
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Castle Co
p. 172

No. 635,090. Patented Oct. 17, 1899.

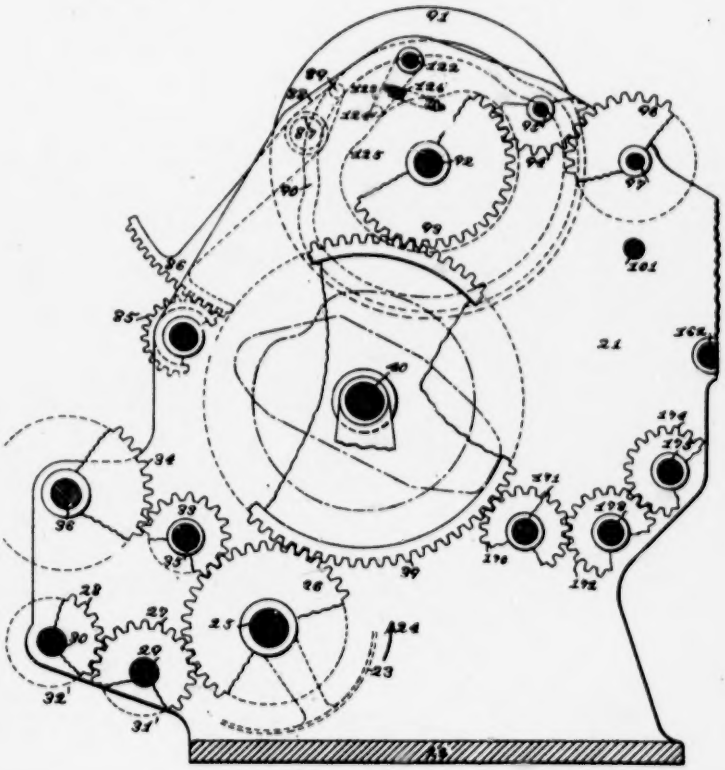
E. E. CLAUSSEN & G. MORTSON.

PAPER BAG MACHINE.

(Application filed June 17, 1899.)

(No Model.) 8 Sheets—Sheet 3.

Fig. 3.



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Atty

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Continental Co. } f. 173
v.
Eastern Co.

No. 635,090. Patented Oct. 17, 1899.

E. E. CLAUSSEN & G. MORTSON.

PAPER BAG MACHINE.

(Application filed June 17, 1899.)

(No Model.) 8 Sheets—Sheet 4

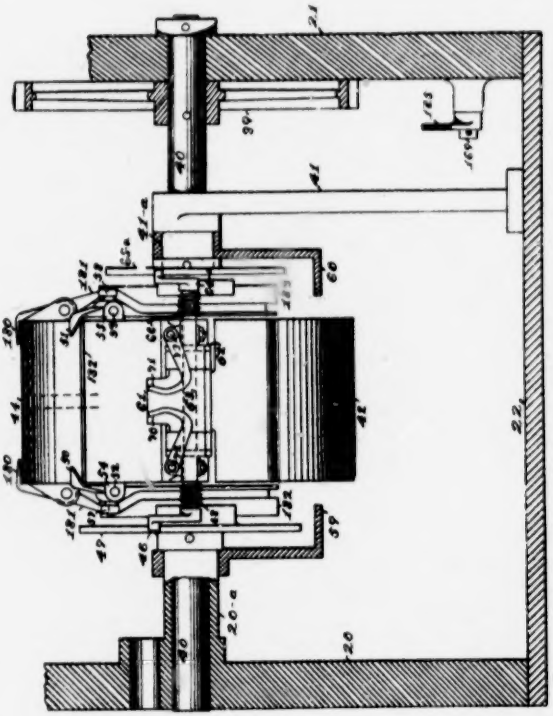

Fig. 4.

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By Edw. E. Claussen Atty

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Continental Co. } p. 174
v.
Eastern Co.

No. 635,090. Patented Oct. 17, 1899.

E. E. CLAUSSEN & G. MORTSON.

PAPER BAG MACHINE.

(Application filed June 17, 1899.)

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Fig. 6.

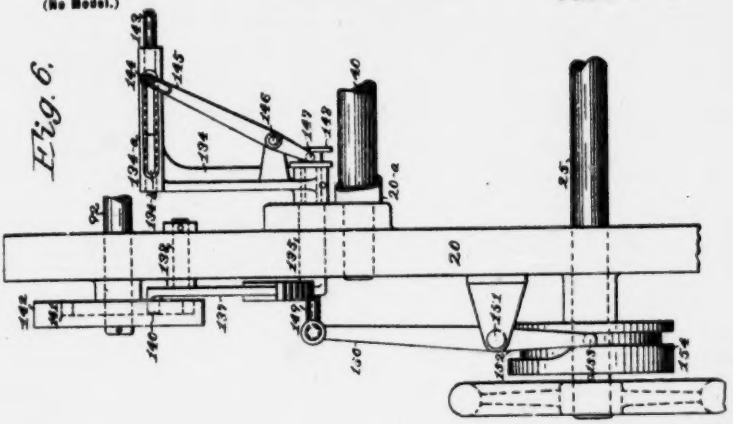
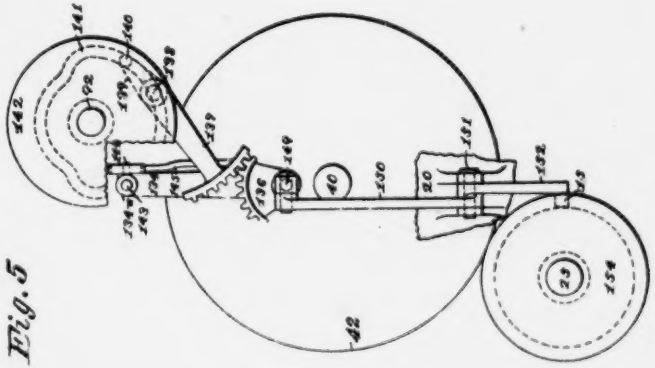


Fig. 5



Witnesses:
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No. 202 Continental Co. } p. 178.
Eastern Co.

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No. 635,090. Patented Oct. 17, 1899.

E. E. CLAUSSEN & G. MORTSON.

PAPER BAG MACHINE.

(Application filed June 17, 1899.)

(No Model.) 8 Sheets—Sheet 6.

Fig. 7.

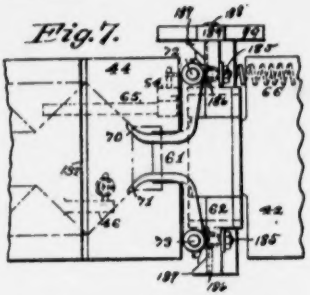

Fig. 8.

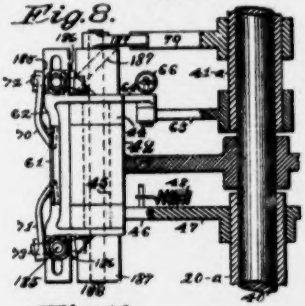

Fig. 9.

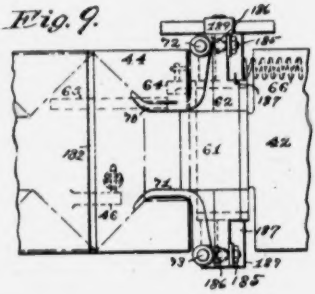

Fig. 10.

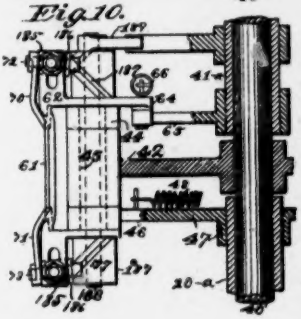

Fig. 11.

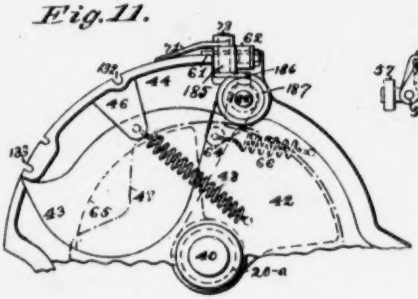

Fig 17.

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Continental Co. } p. 176
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No. 635,090. Patented Oct. 17, 1899.

E. E. CLAUSSEN & G. MORTSON.

PAPER BAG MACHINE.

(Application filed June 17, 1899.)

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Fig. 12.

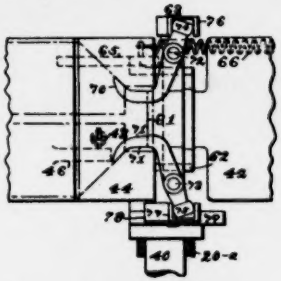


Fig. 13.

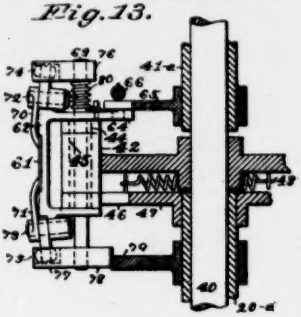


Fig. 14.

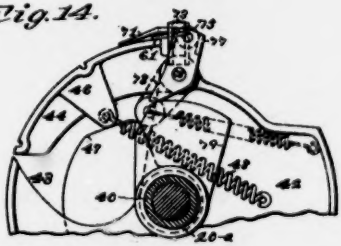


Fig. 15.

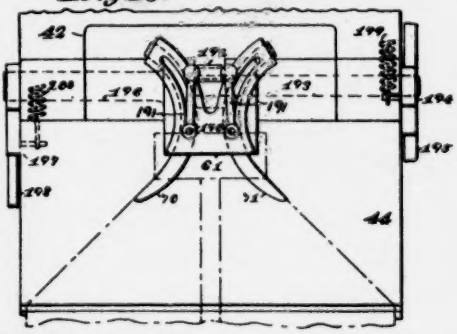
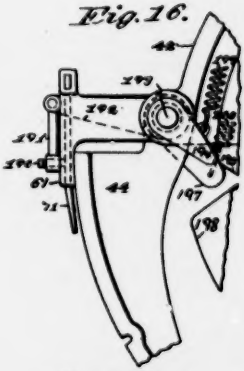


Fig. 16.



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Continental Co. } p. 177
Eastern Co.

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No. 635,090. Patented Oct. 17, 1899.

E. E. CLAUSSEN & G. MORTSON.

PAPER BAG MACHINE.

(Application filed June 17, 1898.)

(No Model.) 8 Sheets—Sheet 8.

Fig. 18.

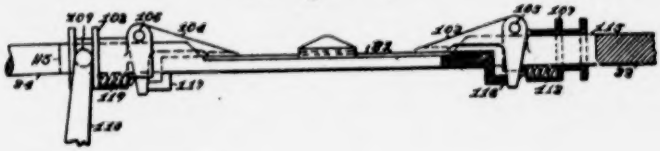
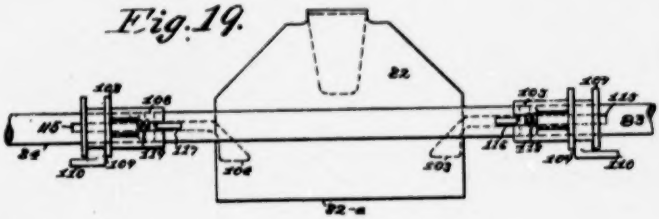


Fig. 19.



Witnesses:
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Inventors:
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George Mortson
By Edward E. Claussen, Atty.

UNITED STATES PATENT OFFICE.

EDWARD E. CLAUSSEN AND GEORGE MORTSON, OF HARTFORD, CONNECTICUT.

PAPER-BAG MACHINE.

SPECIFICATION forming part of Letters Patent No. 635,090, dated October 17, 1899.

Application filed June 17, 1899. Serial No. 720,838. (No model.)

To all whom it may concern.

Be it known that we, EDWARD E. CLAUSSEN and GEORGE MORTSON, citizens of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Paper-Bag Machines, of which the following is a full, clear, and exact specification.

This improvement is particularly applicable to such paper-bag machines as that shown in Letters Patent granted to Edward E. Claussen, No. 598,497, patented February 8, 1898, and also applicable to such a machine as shown in Letters Patent granted to George Mortson, No. 614,123, dated November 15, 1898; and it consists, principally, in improved mechanism for aiding the formation of the diamond when the tucked paper blank is unfolded and refolded into the diamond form.

One object of this invention is to provide a mechanism whereby the leading end of the diamond is formed at an exact predetermined position into accurate proportions, as it is obvious that any distortion or irregular formation will rapidly multiply to such an extent as to make the bag useless and perhaps stop the machine entirely.

Another object of our invention is to provide means, consisting of the ironing-plate, to press and flatten the bag by the oscillating ironing-plate upon the folding-bed and the vibrating tucker-plate.

Another object of this invention is to provide means whereby the rear flap is folded over upon the bag-bottom by a positive mechanism and at a rapid speed.

In our present invention the preferred embodiment herein shown and described in a paper-bag machine comprises in part a suitable bed or framework for supporting the various operative parts of the machine, means for drawing the tucked-paper tube into the machine, a vibrating tucker-plate provided with bevel-edged side nippers trunnioned in stationary frames and arranged to vibrate above the tubular blank in such a manner that as the bottom-forming end of the tube passes along beneath the same the bevel-edged side nippers swing into the tucks of the tube and clasp and hold firmly the upper ply of the tube to the tucker-plate. Coacting with the tucker-plate is the supplemental carrier arranged and operating below the tubular blank, which is pivoted to the conveyer and provided with a pair of bevel-edged side clips adapted to swing into the tucks of the tube and hold the lower ply of the blank to that carrier, a front clip adapted to hold the front end of the bag to the carrier, means for starting and forming at predetermined points the front end of the diamond form, consisting of a diamond finger mounted on the front clip and adapted to swing into the bottom-forming end of the blank during the unfolding of the same and the refolding into the diamond form and adapted to swing out of operative adjustment as soon as the diamond is completed, means for flattening the diamond form on the folding-bed and the tucker-plate, means for turning the first fold over on the bag-bottom, consisting of a finger adapted to be thrust crosswise of the folding-bed and behind the flap and to swing over the surface of the cylinder, whereby the rear flap is turned over on the bag-bottom and then returned to its normal position, and a folder-blade to fold over the second flap, all as will be hereinafter described, and more particularly pointed out in the claims.

The reference-numerals herein used indicate, respectively, the same parts in the different figures of the drawings. The arrows indicate, without further description, the direction of movement of parts.

In the accompanying drawings the various instrumentalities are shown in their most advantageous position, irrespective of the relative position which these parts may have to their respective cam-grooves, and the same is true of all parts hereinafter mentioned, it being considered sufficient for the purpose of this description to assume that the cams are properly cut to effect the various operations required at the proper times and to the required extent.

The machine as herein shown and described employs two supplemental carriers oscillating upon the cylinder; but it is obvious that one supplemental carrier or more than two

can be arranged for, or it is equally well adapted to the machine described in the previously-cited Patent No. 614,123.

The invention will best be understood as described in connection with the drawings, in which it is illustrated, and in which—

Figure 1 is a right-hand side elevation of the machine, taken on the line 1 1 of Fig. 2 and showing the paper blank gripped by the forming mechanism and at a stage where the folding is about to begin and having all the mechanisms in the rear omitted. Fig. 2 is a front elevation of what is shown in Fig. 1. Fig. 3 is a side elevation of the machine, taken on the broken line 3 3 of Fig. 2 and representing the mechanisms which were omitted in Fig. 1. Fig. 4 is a cross-sectional rear end view of Fig. 1 on the broken line 4 4 of Fig. 1 and is shown partly in section and partly in full view. Figs. 5 and 6 are respectively fractional side and rear end views of the rear flap-folder mechanism. Figs. 7 and 8 are respectively plan and end views of a modified form of the diamond fingers and their operating mechanism. Figs. 9, 10, and 11 are respectively a plan, an end, and a side view of a modification of the diamond fingers and their operating mechanism, showing the same in the way they are mounted, whereby they are adapted to be adjusted to a larger size of bag. Figs. 12, 13, and 14 are respectively a plan, an end, and a side view of still another modification of the diamond fingers and their actuating mechanism. Figs. 15 and 16 are respectively a plan and a side view of the last modification of the diamond fingers in operation upon the leading end of the bag-blank which may be made in our machine. Fig. 17 represents a detail front sectional view of the side clips as they are mounted to the carriers. Figs. 18 and 19 are respectively detail plan and front views of the tucker-plate and side nippers carried thereby.

The bed of the machine may be of any suitable construction to support the paper-roll and the former, which may be of any well-known construction, to form the tucked-paper tubing, and that bed is also adapted to support on its upper surface on the right-hand side the frame 20 and on the left-hand side the frame 21, joined by the base-plate 22, and which are adapted to carry the various shafts and mechanisms.

Motion is communicated to the machine by the pulley 23 in the direction of the arrow 24, fastened upon the shaft 25, journaled crosswise in the frames 20 and 21 and which carries on the inner side of the frame 21 the gear 26, secured upon the shaft 25 and meshing into the gear 27, engaging the gear 28, fastened, respectively, on the shafts 29 and 30, placed crosswise of the machine, and also journaled in the frames 20 and 21, and those shafts respectively carry the drawing-rolls 31 and 32. The gear 26 also meshes into the gear 33 and that gear engages the gear 34, which are respectively fastened on the shafts 35 and 36. The shafts 35 and 36 respectively carry the conveyer-rolls 37 and the conveyer-sector 38. By the means just described the previously-severed bag-blank is drawn into the machine and delivered to the bottom-forming mechanisms to perform their respective functions, as will now be described.

On the inner side of the frame 21 and fastened on the shaft 25, as previously stated, is the gear 26, which meshes into the cylinder-gear 39, fastened to the cylinder-shaft 40, which is journaled crosswise to the machine in the frames 20 and 21 and the bracket 41, the latter secured to the base-plate 22. The frame 20 has a projecting bearing 20ª and the bracket 41 has a projecting bearing 41ª, upon which the stationary cams are mounted for operating the various mechanisms, as will be described later. The cylinder-shaft 40 has fastened thereto the mutilated cylinder 42, having the mutilations or sector-like sections 43, into which the supplemental carriers 44 are permitted to oscillate, and the tops or supporting-surfaces of the supplemental carriers form the supplements of the mutilations of the cylinder. The normal position of the supplemental carriers is that position where the tops or folding-surfaces of the carriers form the continuation of the cylinder. In the drawings two of these supplemental carriers are shown (indicated by the same numeral 44) pivoted to the cylinder by the bushings 45. A downward-projecting arm 46 of the carrier 44 is adapted to engage the stationary cam 47, which is mounted on the inwardly-projecting bearing 20ª of the frame 20 and which is held in engagement with that cam by the spring 48. The cam 47 is substantially of such shape that as the supplemental carrier is caused to be carried around by the rotation of the cylinder the carrier is oscillated toward the center of the cylinder and immediately returned to its normal position. The supplemental carriers are provided with two pairs of bevel-edged side clips 50 and 51, pivotally mounted on the shafts 52 and 53, supported in bosses 54 and 55, which project downward and on either side of and beneath the folding surface of the supplemental carriers. The side clips 50 and 51 are held in a closed position upon the surface of the carrier by means of the spring 56 and in an open position by means of the rolls 57 and 58 acting upon the inner surfaces of the cams 59 and 60, which are respectively mounted on the stationary bearings 20ª and 41ª of the frame 20 and the bracket 41. The supplemental carrier is also provided with the narrow front clip 61, which is held on a frame 62, the general appearance of which resembles a yoke, fastened on the shaft 63. One end of the yoke is provided with an arm 64, adapted to engage the outer circumference of the cam 65, which is also mounted on the bearing 41ª of the bracket 41, the spring 66 tending to keep the clip 61 down upon the surface of the cylinder. The tim-

ing of the cam 65, which operates the front clip 61, and the timing of the cams 59 and 60, which cause to operate the side clips 50 and 51, in relation to the rotation of the cylinder and the severing of the bag-blank is such that the front clip 61 is effectively closed by the pressure of the spring as the leading end of the tube advances and holds the lower ply of the tube thereto and the side clips 50 and 51 are caused to enter between the tucks of the tube and hold the lower plies of the tucks to the upper surface of the carrier. The cam 47, which controls the oscillation of the carrier, is of such shape that at this instant the carrier is brought toward the center of the cylinder, and thereby enables the tucks of the tube to distend and to be refolded into the diamond form.

To aid and begin the formation of the diamond fold at the exact predetermined points, we have arranged the diamond fingers 70 and 71, as best shown in Figs. 12, 13, and 14, pivoted, respectively, on pivots 72 and 73 on outwardly-projecting lugs of the yoke-shaped frame 62, and those studs are also provided with cam-arms 74 and 75, provided with roller projections, which engage the grooves in the arms 76 and 77. The arm 77 has a downwardly-projecting branch 78, which engages the upper surface of the stationarily-mounted cam 79, supported on the bearing 20°. A coil-spring 80 tends to draw the diamond fingers 70 and 71 out of engagement with the bag-blank, and therefore the diamond fingers are in their operative position during the time the branch 78 is in engagement with the cam 79.

The diamond fingers are hook-shaped and the defining or working edges of the same are substantially in such a location that when in their inner position of adjustment they form an angle of substantially forty-five degrees with the longitudinal median center line of the bag-blank, as indicated in Figs. 7, 9, 12, and 15.

In the general views, as in Figs. 1, 2, and 4, we have preferably placed the cam that operates the diamond fingers outside of the cylinder, and therefore one branch of the yoke-shaped frame 62 is securely held on a short shaft the outer end of which has connected thereto the cam-arm 64°, engaging the cam 65°, which is mounted on the bearing 41°.

Above the paper-bag blank is mounted the tucker-plate 82 in trunnions 83 and 84, supported in the stationary frames 20 and 21 and capable of being vibrated by means of the pinion-sector 85, which is located on the outside of the frame 21 and securely fastened to the trunnion 84, meshing into the sector 86, which is pivoted on the stud 87, carrying the upward-extending arm 88, having a projection 89 engaging a cam-groove 90 of the cam 91, which is held on the shaft "2, and that shaft is journaled for rotation in the frames 20 and 21. A rotary motion is communicated to the shaft 92 by the gear 93, which meshes into the cylinder-gear 39, and that gear also meshes into the gear 94, which is held on the shaft 95 and journaled in the frames 20 and 21. The gear 94 also meshes into the gear 96, fastened on the shaft 97, which supports the paste-roll 98, revolving in the paste-box 99 and which receives the paste from the bottle 100. The paste-box 99 is properly supported in studs 101 and 102, which project inwardly from the frame 21.

The vibrating tucker-plate is provided with two oppositely-disposed bevel-edged side nippers 103 and 104, pivotally mounted on pivots 105 and 106 in the sleeves 107 and 108, which are adapted to receive a laterally-reciprocating motion by means of the grooved flanges on the sleeves 107 and 108, which are engaged by projections 109 of the arms 110, pivoted on the stud 111, the lower ends of which are provided with the projections 112 engaging grooves 113 in the cams 114. The bevel-edged side nippers are bell-lever shaped and extend through slots 115 in the trunnions 83 and 84, the latter being provided with engaging abutments 116 and 117, against which the bell-lever ends of the bevel-edged side nippers engage as the sleeves 107 and 108 are brought to their inner adjustment, and whereby the bevel-edged side nippers are forced down upon the tucker-plate 82. The bevel-edged side nippers 103 and 104 are thrown in open adjustment by means of the springs 118 and 119, resting in recesses formed in the sleeves when the sleeves are thrust laterally outward. The inward motion of the arms 110 thus carries the nippers in between the tucks of the tube and also closes and presses the nippers on the tucker-plate, as clearly illustrated in Figs. 18 and 19. The center line of the trunnions 83 and 84 coincides with a line that passes through the two intersecting points formed by the edges of the tube and the forty-five-degree edges of the nippers. The distance from the center line of the trunnions to the folding edge 82* of the tucker-plate 82 is substantially equal to the depth of the tucks, and that folding edge serves to define the primary transverse folding-line across the tubular blank as that tucker-plate is vibrated, and the tubular blank is carried onward by the rotation of the cylinder. The timing of the cam-grooves 113, that effect the inward motion of the side nippers, and the timing of the cam-groove 90, which causes to vibrate the tucker-plate 82, is in relation to the rotation of the cylinder and the supplemental carriers carried thereby, with its clips, such that as the bottom-forming end of the tube enters the folding mechanism the tube is gripped by the grippers to the supplemental carriers and simultaneously the nippers enter the tucks and hold the upper plies of the tucks to the tucker-plate. The supplemental carrier as it is carried along by the cylinder is then caused to swing away from the tucker-plate and simultaneously the tucker-plate is caused to vibrate at a rate of speed equal to the combined

movement of the carrier and the rotation of the cylinder, and in this manner the tucks of the tube are distended and unfolded into the well-known inside triangular folds and the folding edge 82* of the tucker-plate defines the primary transverse folding-line across the tube and converts the tubular blank into the diamond form.

As the supplemental carrier rocks from its lowest position back to the normal position the formation of the diamond is then practically completed; but it is pressed into its final proportions by the ironing-plate 120, as will now be described. The ironing-plate 120 is securely held on the arm 121, which is supported by the cross-shaft 122, journaled in and crosswise to the frames 20 and 21, and which carries on the outside of the frame 21 the cam-arm 123, provided with the projection 124, which engages the face of the cam 125. The spring 126 has one end fastened to the cam-arm 123 and the other end secured to the frame 21, and thereby holds the projection 124 against the face of the cam 125, and the timing of that cam is such that when the diamond form is completed by the folding mechanism the ironing-plate 120 is brought downward and presses and flattens the diamond-formed blank into its final proportions upon the carrier and the tucker-plate. After the diamond form is completed the diamond fingers 70 and 71 are withdrawn therefrom and the paste is applied by the paste-sector 128, mounted on the shaft 92, from the paste-segment 129, held on the shaft 93, which has received the paste from the paste-roll 98, which revolves in the paste-box 99.

The gears 93, 94, and 96 are so geared in relation to the cylinder-gear 39 that the face of the paste-sector is presented to the cylinder twice to each revolution of the cylinder, and in this manner the paste is deposited upon each diamond-formed blank as it passes under the paste-sector.

The folding of the rear and front flap is accomplished as follows: The paste-sector 128 has fastened thereto two creaser-blades 130 and 131 at a distance apart measured on the circumference of the paste-sector equal to twice the depth of the tucks, which distance also corresponds with the distance between the transverse creaser-grooves 132 and 133, which are grooved crosswise in the supplemental carriers, the purpose of which we will describe later in connection with the flap-folding mechanism, which we will now describe. Mounted in the frame 20 above the cylinder-shaft is the rear flap-folder arm 134, (best shown in Figs. 5 and 6,) which is mounted on the sleeve 135, carrying on the outer side the sector-pinion 136, meshing into the sector 137, pivoted on the shaft 138, which is supported in the frame 20, and that sector has the upwardly-extending arm 139, provided with the projection 140, engaging a groove 141 in the cam 142. The rear flap-folder arm is provided on the upper side with the hub 134*, serving as a bearing for the finger 143, which is adapted to slide longitudinally in the hub 134*, and thereby also adapted to be placed crosswise over the surface of the cylinder. The in and outward movement of the finger 145 is accomplished by the following mechanism: The finger 143 is provided with the pin 144, projecting through a slot 134* of the hub 134*, and that pin is engaged by the bifurcated arm 145, pivoted on the stud 146, which is supported on the arm 134. The lower end of the bifurcated lever-arm 145 is provided with a projection 147, engaging a groove in the collar 148, which is integral with the rod 149, which is adapted for longitudinal movement and mounted in the central opening of the sleeve 135. The outer end of the rod 149 is pivotally engaged to the arm 150, mounted on the stud 151, the downwardly-projecting arm 152 of which is provided with the projection 153, engaging a groove in the cam 154. By the means just described the finger 143 receives a laterally in-and-outward movement crosswise to the cylinder by means of the cam 154 and its intermediate mechanisms, and also receives a vibratory motion over the surface of the cylinder by means of the cam-groove 141 and its intermediate mechanism, the latter travel being indicated by the dash-and-dot line 155 from the position shown in Fig. 1 to the position marked 156 of Fig. 1.

The front flap is folded over by the mechanisms now to be described. Mounted in the frames 20 and 21 is the stud 157, upon which is mounted the stationary folding-plate 158, of well-known construction, and above that plate is mounted the flap-bar 159, also held in the frames 20 and 21 and of usual construction.

As a convenient means for folding over the front flap, we have shown the folder-blade 160, mounted on the arm 161, supported on the shaft 162, which carries on the inner side of the frame 21 the arm 163, which is engaged by the connecting-rod 164, and which again is jointed to the cam-arm 165, pivoted on the stud 169, and that arm carries the projection 166, engaging a groove 167 in the cam 168, which is securely fastened on the shaft 25.

The cylinder-gear 39 meshes into the gear 170, journaled on the shaft 171, and that gear engages the gear 172, securely fastened upon the shaft 173, meshing again into the gear 174, held on the shaft 175, and those shafts are journaled in the frames 20 and 21 and respectively carry the delivery-rolls 176 and 177.

The cylinder is provided with lugs 178, which carry the pivots 179, to which are fastened the retainers 180, the upper ends of which are substantially hook-shaped, as best shown in Figs. 1 and 4, and when the same are folded over the top of the carrier the lower surface thereof is close to the carrier, but does not press on the same, and they are substantially in that position where they are directly ahead of the creaser-groove 133. The lower ends of the retainers 180 have downwardly-

extending branches 181, which are adapted to engage grooves in the cams 182 and 183, which are respectively mounted on the bearings 20ª and 41ª of the frame 20 and the bracket 41.

After the diamond is completed the blank is carried onward under the paste-sector 128 and the paste delivered to the bag. The creaser-blades 130 and 131 engage, respectively, with the creaser-grooves 132 and 133, creasing the bag at substantially those positions where the flaps are to be folded over, and the creaser-blade 131 thereby causes the rear flap to be raised from the surface of the cylinder, at which time the finger 143 is thrust behind the rear flap and immediately afterward the retainers 180 are thrust into their inner position over the bottom of the bag and in front of the flap, and as the cylinder is carried onward the finger 143 is caused to be oscillated over the surface of the cylinder, thereby turning the rear flap against the retainers 180 down upon the bottom of the bag.

The cylinder is provided with a duplicate set of carriers and coöperating mechanism, as previously stated, which is not essential, but it is preferable on account of the enlargement of the cylinder thereby obtained, which allows the use of larger cams on the sides of the cylinder, whereby easier motions are obtained to operate the various mechanisms, and whereby a greater speed of the machine is effected, and it also does not require the bag to be bent around too small a circumference.

We will now describe some modifications of mechanisms that may be applied to the hook-shaped diamond fingers without departing from the spirit and scope of our invention, and the first of those modifications is represented in Figs. 7 and 8, which permits of a lateral adjustment of the diamond fingers, whereas in Figs. 9, 10, and 11 this modification is shown with the diamond fingers adjusted laterally outward to enable them to operate upon a larger size of bag. The diamond fingers 70 and 71 are pivoted in studs 72 and 73, held in bearings 185, which are laterally adjustable on the yoke-shaped frame. The shafts 72 and 73 are provided on their lower sides with cam-arms 186, which are adapted to engage spirally-cut cam-grooves in the cams 187, which are respectively cut right and left, so that any motion imparted thereto will effectively throw the diamond fingers 70 and 71 out of or into operative engagement. The cams 187 are fastened on the shaft 188, which is provided with the arm 189, engaging the cam 79, fastened on the bearing 41ª of the bracket 41.

Another modification is represented in front and side view in Figs. 15 and 16, in which the narrow portion 61 of the front clip is made thick and is provided with two circular grooves adapted to receive the semicircular diamond-fingers 70 and 71, which are provided with the studs 190 and engaged by the connecting-rod 191, jointed to the arm 192 and fastened on the shaft 193, and that shaft is provided on its outer end with the arm 194, engaging a cam 195, held on the bearing 20ª. The yoke-shaped front clip is provided on the left-hand side with the shaft 196, which has on [illegible] its outer side the arm 197, engaging a cam 198, which is mounted on the stationary bearing 20ª. The spring 199 tends to keep the diamond fingers out of their operative position, whereas the cam 195 throws the same into their operative position. The springs 200 brings the front clip 61 down upon the surface of the carrier and the cam 198 tends to bring the same back out of engagement with the carriers.

The operation of the machine is as follows: The paper is taken from the roll, folded around the former, and converted into a continuous tucked-paper tube of any construction well known in the art, and guided into the bite of the drawing-rolls and severed into bag-blank lengths in any well-known manner, and the severed blanks are guided into the bite of the drawing-rolls 31 and 32, which deliver the blank to the conveyer-roll and the conveyer-sector 38. The bottom-forming end of the tube is then guided into the bottom-forming mechanism in such a manner that the same enters between the tucker-plate 82, provided with the bevel-edged side nippers 103 and 104, and the supplemental carrier 44, which is pivotally mounted to the cylinder 42, which is provided with the front clip 61, the two oppositely-disposed hook-shaped diamond fingers 70 and 71, mounted on the front clip, and the two oppositely-disposed bevel-edged side clips 50 and 51. The tube as it arrives at about the position as shown in Fig. 1 is clasped by the front clip 61, the same being carried onward by the cylinder and effectively closed upon the surface thereof by virtue of the cam 65 and the spring 66, thus holding the lower part of the tube to the carrier. Simultaneously the side clips 50 and 51 are effectively thrust between the tucks of the tube and brought to their inner closed position, and as the cylinder continues to rotate the supplemental carrier is swung away from the tucker-plate and at the same time the tucker-plate is vibrated, the folding edge forming the characteristic primary transverse folding-line across the tubular blank and unfolding and forming the well-known inside triangular folds and converting the tubular blank into the diamond form. The ironing-plate is then brought to its lower downward position, whereby the diamond is pressed into its final proportions on the carrier and the tucker-plate. The side nippers 103 and 104 are then withdrawn, and directly afterward the diamond fingers 70 and 71 are retracted and the bag-blank is carried under the paste-sector 128 to receive the paste, and to which are attached the creaser-blades 130 and 131, which respectively engage the transverse creaser-grooves 132 and 133 and crease the blank

where the edges of the completed bag are to be located and facilitate the subsequent folding operations. As the creaser-blade 131 cooperates with the creaser-groove 133 the rear end of the diamond that forms the rear flap is raised from the carrier and is immediately backed up by the finger 143, thrust behind the flap. The retainers 180 are then brought to their inner position of adjustment, and the finger 143 is then caused to be oscillated over the surface of the cylinder by means of the cam-groove 141 of the cam 142, thereby folding over the rear flap against the retainers upon the folded bottom of the blank. The front clip 61 is then caused to be opened to its extreme backward position, thereby releasing the front end of the diamond, which permits the front flap to spring outward and forward over and above the flap-bar 150 and against the folder-blade 160, and as at this point the folder-blade 160 is moving with the speed of the cylinder downward it engages the bag-blank at that position where the creaser 130 has creased the bag-blank in its coacting creaser-groove 132 until the bag-blank is delivered between the stationary folding-plate 158 and the bar 159, into the bite of the delivery-rolls 176 and 177, and the completed bag may then be carried away by any suitable bands into a drier to be dried and afterward bound and packed for sale and use.

Having thus fully described our invention, what we claim, and wish to secure by Letters Patent, is—

1. The combination of a conveyer, an oscillating carrier, having its forward end pivoted to the conveyer, mechanism to oscillate the carrier upon its pivot, the front clip pivoted to the conveyer, the diamond fingers pivoted to the front clip, and devices for cooperating with the carrier during both parts of its oscillation and during its forward movement with the conveyer, to unfold a paper tube and refold it into a paper-bag blank.

2. The combination of a conveyer, an oscillating carrier pivoted to the conveyer, mechanisms to oscillate the carrier upon its pivot, the front clip mounted on the conveyer, oppositely-disposed diamond fingers mounted on the front clip, a tucker-plate vibrating upon trunnions not substantially on a line with its defining edge, all coöperating during the forward movement of the conveyer, and during both parts of the oscillation of the carrier, and during the vibration of the tucker-plate, to unfold a paper tube and to refold it into a paper-bag blank.

3. The combination of a conveyer, an oscillating carrier pivoted to the conveyer, mechanisms to oscillate the carrier upon its pivot, devices to hold the lower ply of a tucked-paper tube upon the face of the carrier, consisting of the front clip, diamond fingers mounted on the front clip, adapted to enter the bottom-forming end of the tube, and the side clips, a tucker-plate vibrating upon trunnions, devices to hold the upper ply of a tucked-paper tube against the face of the tucker-plate between the line of its trunnions and the line of its defining edge, all coöperating during the forward movement of the conveyer and during both parts of the oscillation of the carrier, and during the forward vibration of the tucker-plate, to unfold a tucked-paper tube and to refold it into a paper-bag blank, having inwardly-inclined triangular folds.

4. A folding-bed adapted to support one side of a paper-bag blank, the front clip mounted on that folding-bed, and adapted to swing forward and clasp the leading end of the bag-blank to the folding-bed, the oppositely-disposed diamond fingers mounted on the front clip and adapted to swing into the bag-blank into substantially that position where each of the defining edges of the diamond fingers form substantially forty-five degrees with the central longitudinal median line of the bag-blank, substantially as described.

5. A folding-bed adapted to support one side of a paper-bag blank, the front clip mounted on that folding-bed, means for effectively closing the front clip to hold the leading end of the bag-blank, the oppositely-disposed hook-shaped diamond fingers mounted on the front clip, means for vibrating the diamond fingers and for swinging the same into the bag-blank into substantially such position that each of the defining edges forms substantially forty-five degrees with the central longitudinal median line of the bag-blank.

6. A folding-bed adapted to support one side of the paper-bag blank, the front clip mounted on that folding-bed, means for effectively closing the front clip, to hold the leading end of the bag-blank, the oppositely-disposed hook-shaped diamond fingers mounted on the front clip, means for vibrating the diamond fingers and for swinging the same into the bag-blank into substantially that position where each of the defining edges forms substantially forty-five degrees with the central longitudinal median line of the bag-blank; and means whereby those fingers may be adjusted laterally, and thereby adapting them to various sizes of bags.

7. The combination of the yoke-shaped front clip terminating in a comparatively narrow plate adapted to clasp the leading end of the bag-blank, means for vibrating the front clip, a pair of oppositely-disposed hook-shaped diamond fingers, mounted on the front-clip yoke, means for simultaneously vibrating those diamond fingers over the narrow portion of the front clip into the bag-blank into substantially such a position that the defining edges of those diamond fingers each form substantially forty-five degrees with the central longitudinal median line of the bag-blank, when in their operative position.

8. In a paper-bag machine, the combination of a conveyer, an oscillating carrier pivoted thereto, operating means to cause the same

to oscillate and means to hold the lower part of the tubular blank thereto, consisting of the side clips, the front clip, the diamond fingers mounted on the front clip, the tucker-plate trunnioned in uprights and provided with side nippers, operating means to cause the tucker-plate to vibrate, and means to close the nippers on the tucker-plate, all parts combined and operating to distend and unfold the tucked-paper tube and form the inside triangular folds while the carrier oscillates, the tucker-plate defining the primary transverse line across the blank and the diamond fingers forming the leading end of the diamond, the whole operating to convert the blank into the diamond form while the blank is carried onward by the conveyer, substantially as described.

9. In a paper-bag machine, the combination of a conveyer, the carrier pivotally mounted thereon, operating means to cause the same to be oscillated, the front clip, the oppositely-disposed hook-shaped diamond fingers, mounted on the front clip, the two oppositely-bevel-edged side clips arranged to hold the lower part of the tubular blank to the carrier, the tucker-plate trunnioned in the uprights, and provided with the side nippers, operating means to vibrate the tucker-plate, and operating means to cause the side nippers to swing down upon the tucker-plate and hold the upper part of the tubular blank, all parts combined and operating to distend and unfold the tubular blank to form the inside triangular folds and the leading end of the diamond form by the diamond fingers while the tucker-plate defines the primary transverse folding-line across the blank, the whole operating to convert the tucked-paper tube into the diamond form, while the same is carried onward by the conveyer, substantially as described.

10. In a paper-bag machine, the combination of the cylinder provided with the mutilations, the carrier pivotally mounted on the cylinder, means for imparting thereto an oscillatory motion, a front clip, the oppositely-disposed hook-shaped diamond fingers mounted on the front clip, the two oppositely-disposed bevel-edged side clips, the tucker-plate trunnioned in the uprights and provided with bevel-edged side nippers, operating means to vibrate the tucker-plate so that the folding edge travels with the combined movement of the cylinder and the carrier, and while the diamond fingers are in their inner position of adjustment, and while the defining edge of the tucker-plate defines the primary transverse folding-line, substantially as described.

11. In a paper-bag machine, the combination of a folding-bed, devices to hold the lower plies of a tucked-paper tube to that folding-bed, the tucker-plate cooperating with that folding-bed, devices to hold the upper plies of the tucked-paper tube to the tucker-plate, the vibrating ironing-plate to press the folded diamond into its final proportions upon the folding-bed and the tucker-plate, substantially as described.

12. A folding-bed adapted to support a paper-bag blank, a folding mechanism adapted to turn over the rear flap, consisting of the finger 143 adapted to be thrust laterally across the folding-bed back of the rear flap and also adapted to be oscillated over the top surface of the folding-bed, and at a rate faster than the rotation of the cylinder, for the purpose of turning over the rear flap upon the bag-bottom, substantially as described.

13. A folding-bed adapted to support a paper-bag blank, a folding mechanism adapted to turn over the rear flap, consisting of the finger 143 adapted to be thrust laterally across the folding-bed back of the rear flap, and also adapted to be oscillated over the top surface of the folding-bed, the retainers 180 adapted to be thrust over the bag-bottom ahead of the flap, all combined and operating substantially as described.

14. A folding-bed adapted to support a paper-bag blank, a folding mechanism adapted to turn over the rear flap, consisting of the finger 143, actuating mechanism whereby the finger is thrust laterally across the folding-bed behind the rear flap, means for oscillating the finger over the top surface of the folding-bed, the retainers 180, means for actuating the retainers, consisting of the stationary cams 182 and 183, all combined and operating in such a manner that the finger 143 is thrust behind the rear flap, and then effectively turns that flap over upon the bottom of the bag against the retainers, substantially as described.

15. The combination of the arm 134, the finger 143 supported in the arm, the sector-pinion 136, the sector 137, the cam 142, the bifurcated arm 145, the rod 149, the arm 150 and the cam 154, all combined and operating to thrust the finger laterally across the folding-bed behind the rear flap, and then cause the same to be oscillated over the top surface of the carriers, substantially as described.

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PAPER BAG MACHINE.

No. 598,497. Patented Feb. 8, 1898.

Fig. 1.

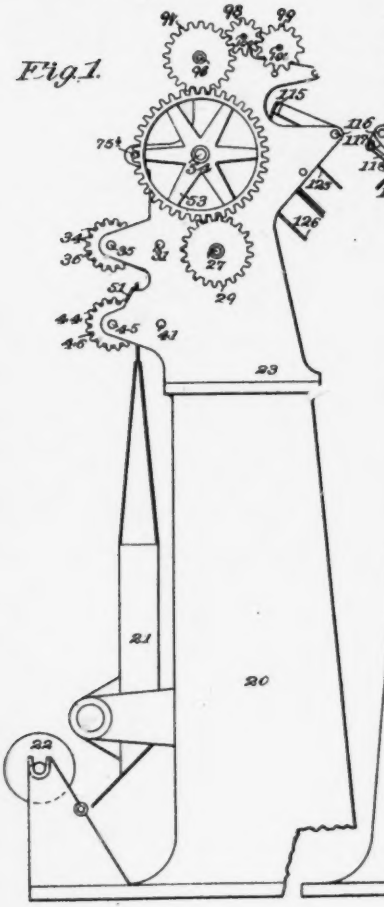

Fig. 2.

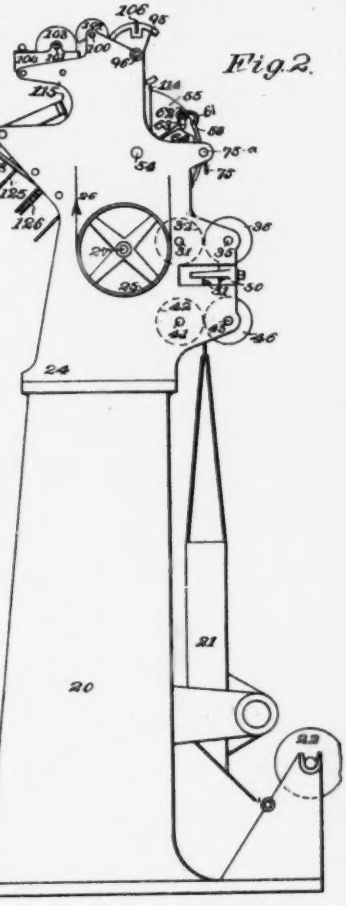

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Fig. 3

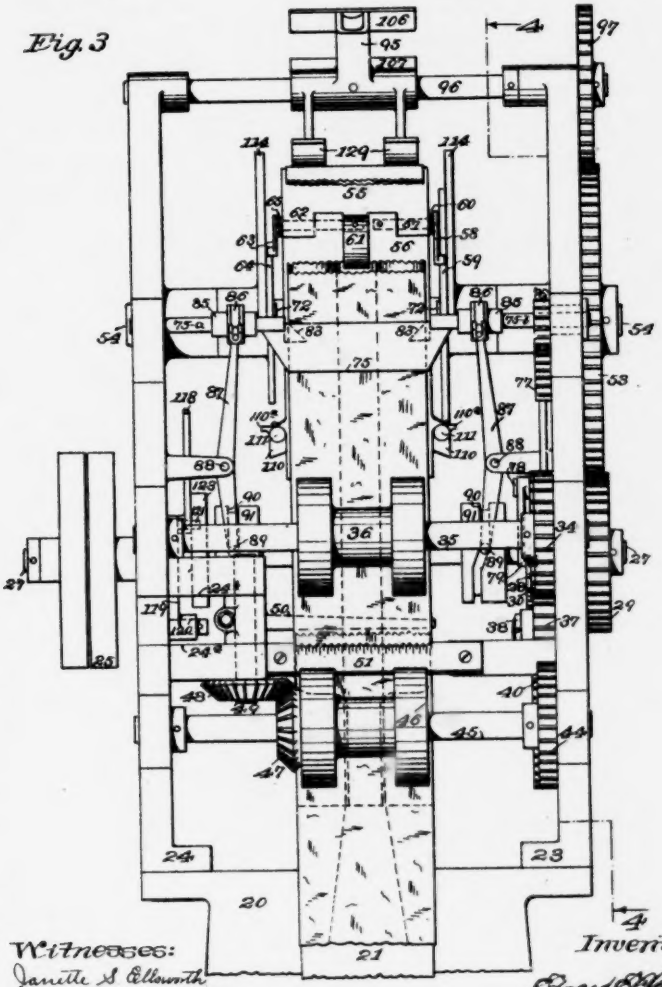

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Fig. 4.

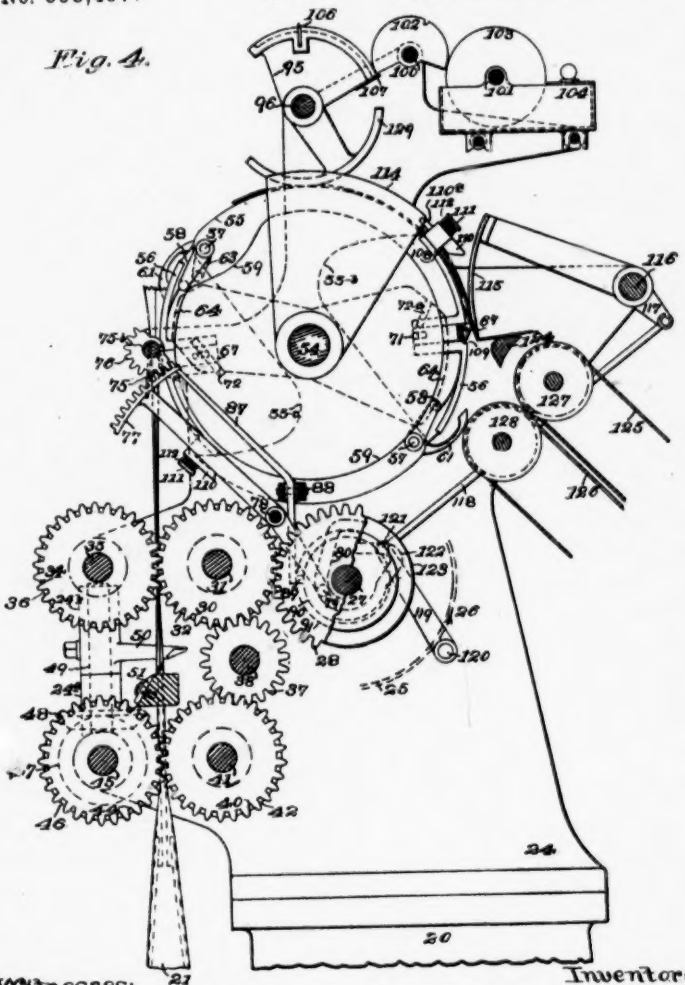

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Fig. 5

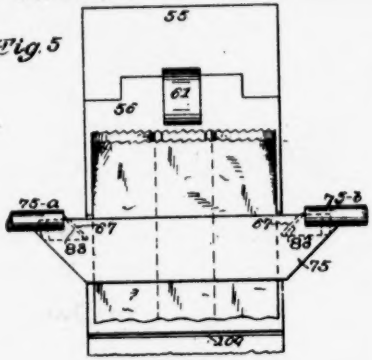

Fig. 6

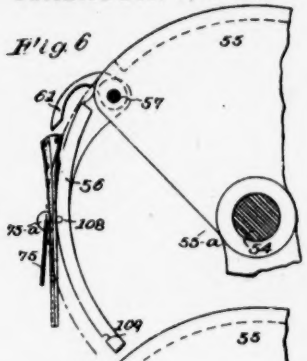

Fig. 7

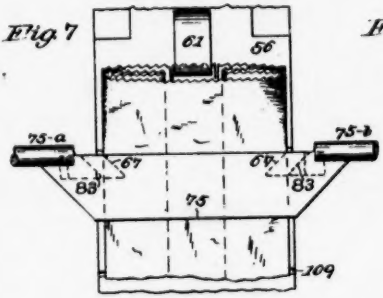

Fig. 8.

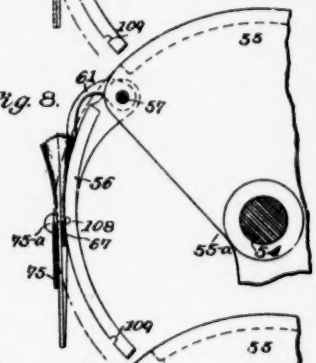

Fig. 9

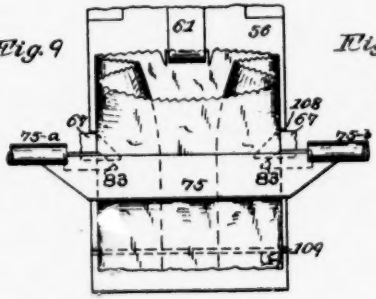

Fig. 10

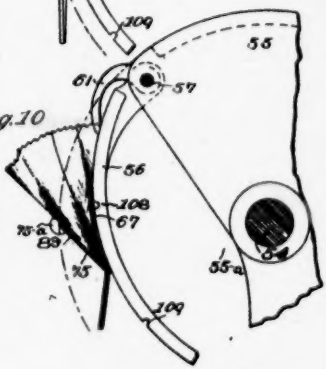

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Fig. 11.

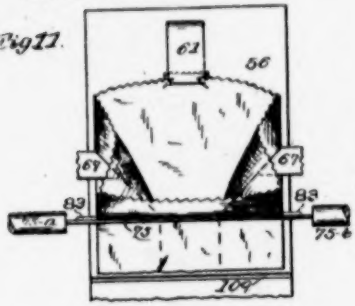

Fig. 12.

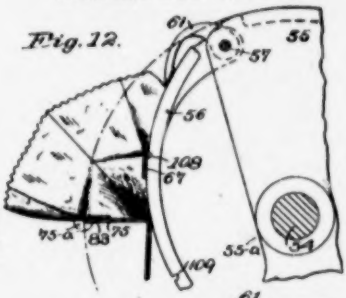

Fig. 13.

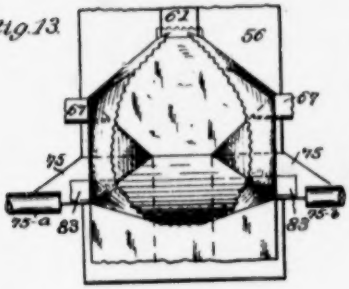

Fig. 14.

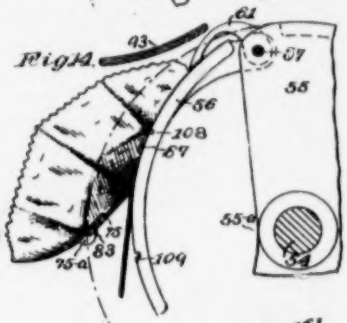

Fig. 15.

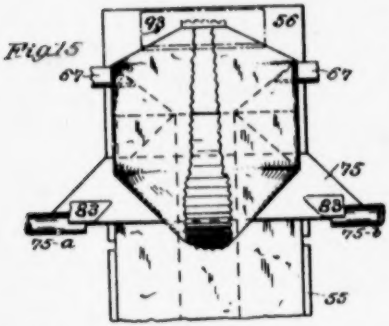

Fig. 16.

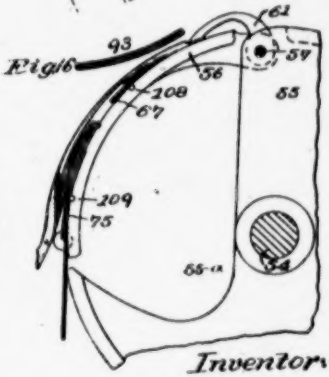

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Fig. 17

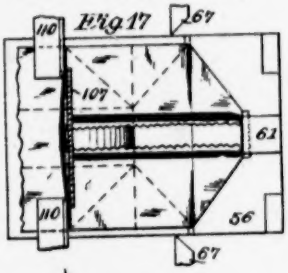

Fig. 19

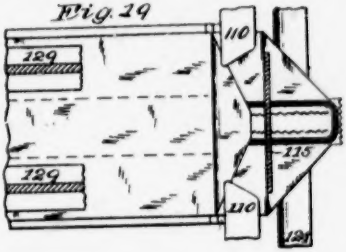

Fig. 18

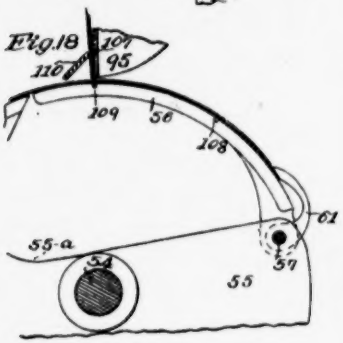

Fig. 20.

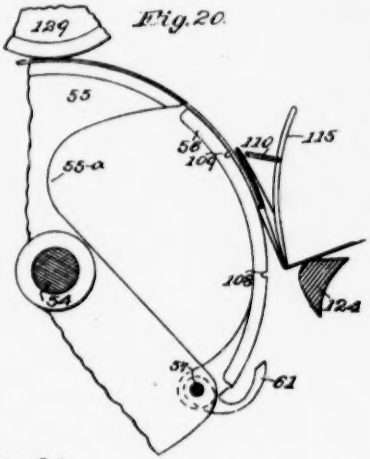

Fig. 21.

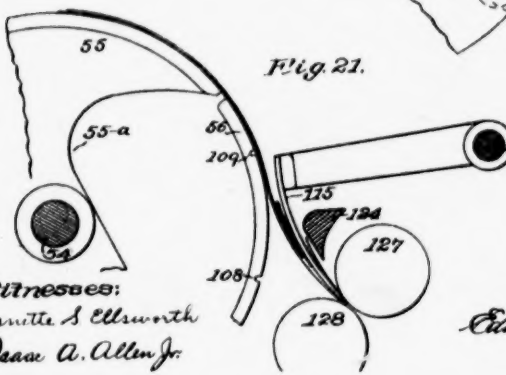

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Fig. 22

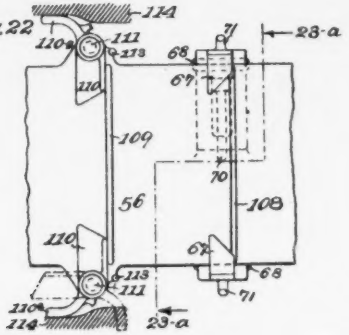


Fig. 23

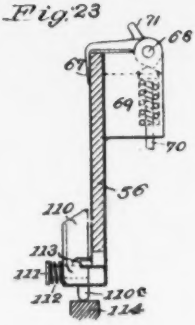


Fig. 24

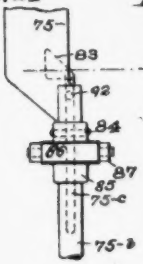


Fig. 25

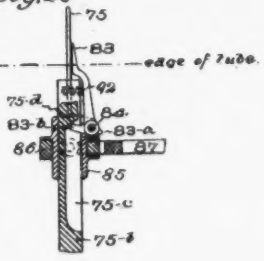
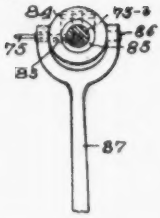


Fig. 2.



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PAPER BAG MACHINE.

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Fig. 28

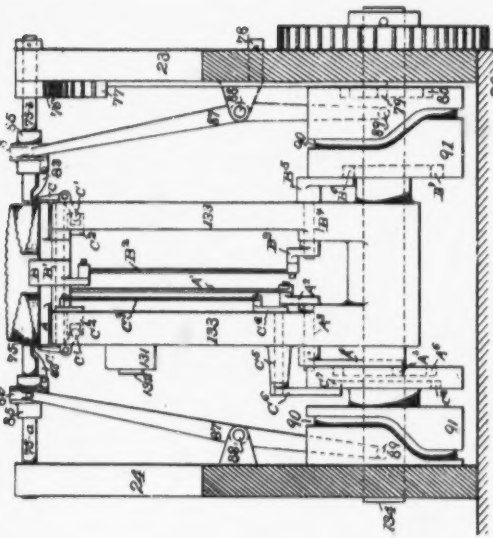


Fig. 30

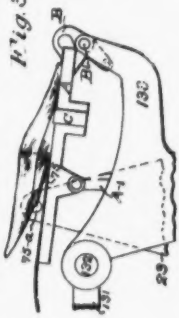


Fig. 29

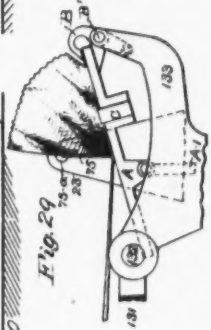
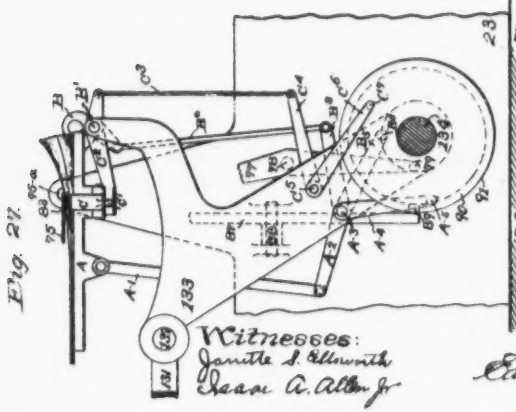


Fig. 27.



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UNITED STATES PATENT OFFICE.

EDWARD E. CLAUSSEN, OF HARTFORD, CONNECTICUT, ASSIGNOR TO ALBERT H. WALKER, TRUSTEE, OF SAME PLACE.

PAPER-BAG MACHINE.

SPECIFICATION forming part of Letters Patent No. 598,497, dated February 8, 1898.

Application filed July 29, 1896. Serial No. 600,361. (No model.)

To all whom it may concern:

Be it known that I, EDWARD E. CLAUSSEN, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Paper-Bag Machines, of which the following is a full, clear, and exact specification.

This machine automatically manufactures continuous tucked-paper tubing into square-bottom paper bags like those of Reissue Letters Patent No. 10,083.

The mechanisms herein shown and described have the folding-bed represented as a supplemental carrier, which is pivoted to a conveyer and adapted to be oscillated when the blank is held to that folding-bed and during the period the conveyer propels the carrier onward. The conveyer may be a continuous-rotating cylinder or a reciprocating or oscillating carriage, and I have therefore shown and described this invention in its adaptation to both of those types of machines.

In my present invention a continuous tucked tube is formed on a former, drawn through a set of drawing-rolls, and severed into bag-blank lengths and delivered into the bottom-forming mechanisms for forming the characteristic primary transverse folding-line and unfolding the tucks and forming the inside triangular folds, and the diamond-formed blanks thus produced are transferred to mechanisms for pasting, cross-folding, and closing the flaps to complete the bag.

The bottom-forming mechanisms consist of a vibrating tucker-plate provided with bevel-edged side nippers trunnioned in stationary frames and arranged to vibrate above the tubular blank in such a manner that as the bottom-forming end of the tube passes along beneath the same the bevel-edged side nippers swing into the tucks of the tube and clasp and hold them to the tucker-plate. Coacting with the tucker-plate is a supplemental carrier arranged and operating below the tubular blank and which is pivoted to the "conveyer," (as I have arbitrarily called the same,) which may be a cylinder, or on a rocking carriage, as is shown in the drawings. The supplemental carrier is also provided with a pair of bevel-edged side clips and a front clip, the former adapted to swing into the tucks of the bellows-sided tube and hold the plies of the lower tucks, and the latter arranged to swing down on the lower ply of the tube and hold the same to the supplemental carrier. The tube being held by these instrumentalities, the tucker-plate is caused to vibrate on its trunnions mounted in the stationary frames, and simultaneously the supplemental carrier is caused to oscillate, and thus the tube is unfolded, the primary transverse folding-line across the tubular blank is defined, the inside triangular folds formed, and the well-known diamond form produced.

The machine as herein shown and described in its preferred construction employs two supplemental carriers oscillating upon a cylinder; but it is obvious that one supplemental carrier will answer, or more than two can be arranged for, depending upon the length and size of the bag to be produced.

Figure 1 represents a right-hand side elevation of the machine of preferred construction, the conveyer being represented as a continuous-revolving cylinder. Fig. 2 is a left-hand side elevation of that which is represented in Fig. 1. Fig. 3 is a front view of the machine, drawn on an enlarged scale, showing the tucked-paper tube gripped between the drawing-rolls and in a position ready for the bottom-forming mechanisms to operate thereon, also showing the striker in a position ready to sever the blank from the continuous tube, and also showing a part of the broken-away former. Fig. 4 is a side view taken on the broken line 4 4 of Fig. 3 in the direction of the arrows. Figs. 5 to 21, inclusive, show plan and edge views of the blank at different stages when the bottom-forming mechanisms are in operation thereon or the flaps being folded. The views are drawn on an enlarged scale in relation to the previous views. Figs. 22 and 23 represent a plan and an end view of the bevel-edged side clips as arranged on the supplemental carrier, taken on the broken line 23 of Fig. 22 in the direction of the arrows, also showing the mode of operation and detail construction of the rear-flap-folding mechanisms. Figs. 24, 25, and 26 are a plan, an end, and a side view of the tucker-plate with its side nippers operating thereon. Figs. 27 and

28 are a side and end view, respectively, of a modified form of the conveyer adapting the supplemental carrier to a rocking or reciprocating carriage and showing the blank clasped by the front clip and bevel-edged side clips to that carrier. Figs. 29 and 30 represent the blank in a further advanced stage than that shown in Fig. 27.

In the following specification and accompanying drawings similar letters and numerals of reference designate like or equivalent parts wherever found throughout the several views, and the numeral 20 designates the frame of the machine, to which is attached the former 21 in the well-known manner and which also supports at the lower end in brackets the roll of paper 22, from which the paper is drawn and folded into the continuous tucked tubing from which the bag-blanks are severed. At the upper end the frame carries on each side the uprights 23 and 24, in which the various shafts and mechanisms are journaled, as hereinafter more fully described.

Motion is communicated to the machine by means of the pulley 25, driven in the direction of the arrow 26, (see Fig. 2,) fastened to the shaft 27, which is journaled in the uprights 23 and 24 and carries on the inner side of the upright 23 a gear 28 and on the outer side of the upright the gear 29, from which the different mechanisms are driven.

The gear 28 meshes into the gear 30, which is fastened to the shaft 31, which is journaled in the uprights 23 and 24 and has fixed upon it the upper rear drawing-roll 32. The gear 30 meshes into the gear 34, which is fastened to the shaft 35, which is journaled in the uprights 23 and 24 and has fastened thereto the upper front drawing-roll 36. The gear 30 also meshes into the intermediate gear 37, which is rotatably mounted on the stud 38, fastened to the upright 23, and which meshes into the gear 40, fastened to the shaft 41, which is journaled in the uprights 23 and 24 and has fixed upon it the lower rear drawing-roll 42. The gear 40 meshes again into the gear 44, fastened onto the shaft 45, which carries the lower front drawing-roll 46. Fastened to the shaft 45, on the left-hand side of the drawing-roll 46, is the miter 47, meshing into the miter 48 on the striker-shaft 49, which is journaled in projecting lugs 24^a and 24^b of the upright 24 and carries clamped thereto the striker-arm 50, which revolves across the path of the tube, carrying it against the serrated knife 51 and severing a blank at each rotation. The gears 30, 34, 40, and 44, with their corresponding rolls 32, 36, 42, and 46, are so geared in relation to the striker-arm 50 that to each revolution of the striker-arm a suitable length of tubing is drawn forward to make the body and the bottom-forming end of the bag-blank.

By the means above described a continuous motion is transferred from the driving mechanisms to the drawing-rolls, the tucked-paper tube severed into bag-blank lengths and delivered to the bottom-forming mechanisms to perform their respective functions, as will now be explained.

On the right-hand side of the upright 23 and fastened to the shaft 27, as previously stated, is the gear 29, which meshes into the cylinder-gear 53, fastened to the shaft 54, which is journaled in the uprights 23 and 24, and has fastened thereto the mutilated cylinder 55, having the mutilations or sector-like sections 55^a and 55^b, into which the supplemental carriers are permitted to oscillate, and the tops or supporting-surfaces of the supplemental carriers form the supplement of the mutilation of the cylinder. The normal position of the supplemental carriers is that position where the tops or folding-surfaces of the carriers form the continuation of the cylinder. In the drawings two of these supplemental carriers are shown, (indicated by the numeral 56,) pivoted to the cylinder by the shaft 57, the free end of which has attached thereto the cam-arm 58, adapted to engage the stationary cam 59, mounted on the inwardly-projecting hub of the upright 23.

60 is a spring that keeps the cam-arm 58 in engagement with its cam, which is of such shape that as the supplemental carrier is carried around by the rotation of the cylinder the carrier is caused to be oscillated toward the center of the cylinder and immediately returned to its normal position, as clearly shown in the drawings from Figs. 3 to 21, inclusive.

The supplemental carriers are provided with front clips 61, fastened to shafts 62. Their free ends are provided with cam-arms 63, engaging the stationary cam 64, fastened to a projecting hub of the upright 24. The timing of the cam 64 in relation to the rotation of the cylinder and the severing of the blank by the rotation of the striker-arm is such that the front clip 61 is caused to close against the pressure of the spring 65 as the leading end of the tube advances and holds the lower ply of the tube thereto, as shown in Figs. 3 to 21, inclusive, to carry the same onward and to release the same again when the diamond form is completed. The supplemental carriers are also provided with two pairs of bevel-edged side clips—that is, with each front clip is coacting one pair of oppositely-disposed bevel-edged side clips 67, pivotally mounted on shafts 68 in bosses 69 beneath the folding-surfaces of the supplemental carriers. The side clips are held in an open or closed position by the spring-pressed plungers 70 and operated by the projections 71, as best shown in Figs. 22 and 23. These projections 71 are caused to operate as the cylinder revolves by the cam-strips 72 and 72^a, respectively fastened on the right-hand side of the machine to the stationary cam 59 and on the left-hand side to the stationary cam 64. The cam 59, which causes to operate the supplemental carriers 53, the cam 64, which

causes to operate the front clips 61, and the cam-strips 72 and 72^a, which cause to operate the bevel-edged side clips as the cylinder revolves, are so shaped in relation to the rotation of the cylinder and the advancing bottom-forming end of the tucked-paper tube that the folding-surface of the supplemental carrier is slightly brought out of its normal position—that is, out of the circular path of the cylinder, (see Figs. 4, 5, and 6)—to enable the tucks of the tube to distend and open to allow the side clips, as well as the front clips, to enter more readily and hold the lower ply of the tube and the lower plies of the tucks to that supplemental carrier and to carry the blank onward, while the remainder of the bottom-forming mechanisms that are mounted above the paper-bag blank are in engagement therewith, as will now be fully explained.

Above the paper-bag blank is mounted the tucker-plate 75 in trunnions 75^a and 75^b in the stationary uprights 23 and 24 and capable of being vibrated by means of the pinion-sector 76, rigidly connected to the trunnions 75^b and meshing into the sector 77, pivotally mounted on the stud 78, which is attached to the inner side of the upright 23. The lower projecting arm of the sector 77 is provided with the projection 79, engaging a cam-groove 80 in the gear 28.

The vibrating tucker-plate is provided with two oppositely-disposed bevel-edged side nippers 83, pivotally mounted by the pivots 84 in the slides 85, which are adapted to receive a lateral oscillatory motion by means of the collars 86, the laterally-projecting trunnions of which engage the bifurcated arms 87, pivoted in the projecting hubs of the uprights 23 and 24 on the studs 88. The lower ends of the arms 87 are provided with the extensions 89, engaging cam-grooves 90 of cams 91. Springs 92 tend to press the nippers away from the tucker-plate, and thus open the same to the extent permitted by the lugs 83^b, which come in contact with the collar 86. The nippers 83 are closed and pressed on the tucker-plate by means of extension 83^b, projecting into the spline 75^c of the trunnions and abutting the end of the spline in the trunnions, as at 75^d. The inward motion of the arms 87 thus cause to close and press the nippers on the tucker-plate, as is clearly illustrated in Figs. 24, 25, and 26. The center line of the trunnions 75^a and 75^b coincides with a line that passes through the two intersecting points formed by the edges of the tube and the forty-five-degree edges of the nippers.

The distance from the center line of the trunnions to the folding edge of the tucker-plate is substantially equal to the depth of the tucks, and that folding edge serves to define the primary transverse folding-line across the tubular blank as the same is propelled onward by the cylinder. The timing of the cam-grooves 90, that cause to operate the side nippers, and the cam-groove 80 in the gear 28, that causes to vibrate the tucker-plate 75, is in relation to the rotation of the cylinder and the supplemental carrier carried thereby with its clips such that as the bottom-forming end of the tube enters the folding mechanisms the tube is gripped by grippers on the supplemental carrier and simultaneously the nippers enter the tucks and hold the upper plies of the tucks to the tucker-plate. The supplemental carrier as it is carried along by the cylinder is then caused to swing away from the tucker-plate and simultaneously the tucker-plate is caused to vibrate at the rate of speed of the combined movement of the carrier and the rotation of the cylinder, and in this manner the tucks of the tube are distended and unfolded into the well-known inside triangular folds, and the tucker-plate defines the primary transverse folding-line across the tube, as is clearly shown in the drawings in Figs. 5 to 16, inclusive, and converts the tubular blank of Figs. 5 and 6 into the diamond form of Figs. 15 and 16.

As the supplemental carrier rocks from its lowest position back to the normal position the formation and the flattening of the diamond are aided by rocking against a stationary folder-plate, as at 93, (see Figs. 14 to 16,) held on a rod supported by the uprights 23 and 24. After the diamond is completed the paste is applied by sector 95, fastened to shaft 96, carrying connected thereto the gear 97 and meshing into the cylinder-gear 53. The gear 97 also drives the gears 98 and 99 on shafts 100 and 101, which have fastened thereto the paste-quadrant 102 and paste-roll 103, the latter turning in the paste-box 104.

The gears 97, 98, and 99 are geared with relation to the cylinder-gear 53 in such a manner that the face of the sector is presented to the cylinder twice to each revolution of the cylinder, and in this manner the paste is deposited upon each diamond-formed blank as it passes under the paste-sector.

The folding of the rear and front flaps is accomplished as follows: The paste-sector 95 has fastened thereto the two creaser-blades 106 and 107 at a distance apart measured on the circumference of the paste-sector equal to twice the depth of the tucks, which distance corresponds with the distance between the transverse creaser-grooves 108 and 109 in the supplementary carriers. To the supplementary carriers are pivotally mounted on studs 111, carried by lugs projecting on each side thereof, the plicators 110, held in their normally open position, as shown in Fig. 22 in the dash-and-dotted position, by springs 112 against stop-pins 113. The outer ends of the plicators have the projections 110^a, which as the carriers are carried around come in engagement with stationary cams 114, mounted on hubs, turning the same into the positions of Fig. 22 and beyond, as shown therein. The folding ends of the plicators that come in contact with the rear flap are preferably beveled about forty-five degrees,

with the tangential line passing through a point in the circumference of the cylinder where the plicators approach the nearest. The folder 115 for turning and folding the front flap is mounted on shaft 116, and journaled in the uprights 23 and 24, and on the left-hand side the shaft has fastened thereto an arm 117, to which is connected the connecting-rod 118, to the lower end of which is hinged the cam-arm 119 on the stationary stud 120. At the upper end of the arm 119 the same is provided with the projection 121, adapted to enter the cam-groove 122 of the cam 123. The folder-bar 124 reaches across from the upright 23 to the upright 24, and over that folder-bar the front flap is folded, as shown in Figs. 4, 19, 20, and 21, and then the completely-folded blank is delivered to bands 125 and 126, passing over delivery-rolls 127 and 128. The timing of the cams 114, that operate the plicators 110, and the timing of the cam 123, that operates the folder 115, and the timing of the cam 64, that operates the front clip 61, are such relatively to each other and to the rotation of the cylinder that the front clip 61 releases the forward end of the diamond blank before the cylinder has revolved far enough to carry that forward end down opposite the bar 124 and so that the plicators turn the rear end of the diamond form over upon the middle of the diamond form before the cylinder has revolved far enough to put the groove 109 opposite the bar 124 and so that the folder 115 thereupon engages with the blank along the transverse crease opposite the groove 109 and carries that part forward under the bar 124 into the bite of the rolls 127 and 128, and thus causes the bar 124 to fold the forward end of the diamond form backward over the middle part of the diamond form and over the rear flap, so as to complete the folding of the bag.

Figs. 27, 28, 29, and 30 represent this machine in the form where the supplemental carrier is attached to an oscillating conveyer instead of to a rotating cylinder.

The connecting-rod 131 is worked by a crank (not shown in the drawings) and is pivoted by a stud 132 to the rocking carriage 133, and that carriage rocks upon the shaft 134 in the uprights 23 and 24. The operation of the vibratory tucker-plate 75, with its coacting side nippers, is identical with the foregoing description, and therefore needs no further explanation. The supplemental carrier A receives an oscillatory motion by means of the connecting-rod A', attached to arm A^3 on the shaft A^3, mounted in the carriage 133, the outer free end having attached the arm A^4, provided with projection A^5, engaging the cam-groove A^6.

At the front end of the carriage is pivotally mounted the front clip B on the stud B' and operatively connected to the connecting-rod B^2, attached to the arm B^3, fastened to the shaft B^4, the free end of which has connected thereto the cam-arm B^5, provided with the extension B^6, engaging the cam-groove B^7. The bevel-edged side clips C, which are pivoted in hubs adjacent to and below the folding-surface and on oppositely-disposed sides of the supplemental carrier, have the extensions C', which engage the arms C^2, which are fastened to the shaft B', operatively connected to the connecting-rod C^3, the lower end of which is pivoted to the arm C^4, fastened to the shaft C^5, on the outside of which is carried the arm C^6, having the extension C^7, which engages the cam-groove C^8. The cam-groove A^7, that causes to operate the supplemental carrier A, the cam-groove B^7, that operates the front clip B, and the cam-groove C^8, that operates the side clips C, are timed in relation to the oscillation of the reciprocating carriage 133 so that when the carriage is in the position nearest to the drawing-rolls the supplemental carrier is lowered to the amount to safely allow for the entering of the bottom-forming end of the tucked-paper tube between the carrier and the tucker-plate. The front clip B and the side clips C are then caused to close, the former holding the lower ply of the tube and the latter entering into and between the tucks and holding the lower plies of the tucks. Simultaneously the side nippers 83 enter the tucks and hold the upper plies of the upper tucks to the vibrating tucker-plate. The blank being held by the instrumentalities just described, the carriage 133 is rocked forward, the supplemental carrier A is caused to be lowered, and the tucker-plate caused to be vibrated by its respective cams through the positions as shown in Figs. 29 and 30, thus unfolding the tucks and producing the inside triangular folds and defining the primary transverse folding-line across the tubular blank and converting the tucked-paper tube into the well-known diamond form, which may then be drawn from the carriage and the end flaps folded by any of the well-known mechanisms.

The operation of the machine is as follows: The paper is taken from the roll 22 at the base of the frame, folded around the former 21, and converted into a continuous tucked-paper tube, which is guided into the bite of the drawing-rolls 42 and 46, under the serrated knife 51, and between the rolls 32 and 36, and as the striker revolves across the path of the tube it forces the tube against the serrated edge of the knife 51 and severs the blank therefrom at each revolution. The drawing-rolls are so geared with relation to the revolution of the striker as to feed through a suitable length for each rotation thereof. The bottom-forming end of the tube is then guided into the bottom-forming mechanisms in such a manner that the same enters between the tucker-plate 75, provided with the bevel-edged side nippers 83, and the supplemental carrier 56, which is pivotally mounted to the cylinder 55 and which is provided with the front clip 61 and the two oppositely-disposed

bevel-edged side clips 67. The tube as it arrives at about the position as shown in Figs. 5 and 6 is clasped by the front clip 61, the same being carried by the cylinder, and by virtue of the cam 64 the side clips 67 are then caused to close by means of the cam 72, thus holding the lower part of the tube to the supplemental carrier. Simultaneously the side nippers 83 are caused to close by means of cam-groove 90, and as the cylinder continues to rotate the supplemental carrier is swung away from the tucker-plate and the tucker-plate vibrated at the same time, the folding edge forming the characteristic primary transverse folding-line across the tubular blank and unfolding and forming the well-known inside triangular folds, passing from the positions as shown in Figs. 5 to 16, inclusive, and converting the tubular blank into the diamond form. The paste is then applied thereto from the paste-box 104, the roll 103, quadrant 102, and the paste-sector 95, to which are attached the creaser-blades 106 and 107, which engage the transverse creaser-grooves 108 and 109, respectively, the creaser-blade 107 and the creaser-groove 108 coöperating to make a crease across the diamond blank and thereby to somewhat raise the rear end of the diamond, which is immediately backed up by the plicators 110, carried by the supplemental carrier and engaging the cam 114, as shown in Figs. 17 and 18. The motion of the plicators continues until the flap is completely turned forward, and meanwhile the front clip 61 has been opened, the spring of the paper causing the front flap to be thrown over the flap-bar 124 and against the folder-blade 113. Each plicator is then returned to its normal position and the folder-blade then caused to move downward at a rate to remain with its folding edge in the creased line formed by the creaser-blade 106 and the groove 108 until the bag is delivered into the bite of the delivery-rolls and carried away by the bands 125 and 126 into a drier to be dried, and afterward bound and packed for sale and use.

This machine is distinguished from all prior machines for making square-bottom paper bags in many respects, one of which consists in the new mode of operation by which it folds the diamond form of the paper. That new mode of operation includes carrying both plies of the paper tube at the primary transverse folding-line, which is defined by the lower edge of the tucker-plate, forward under the secondary transverse folding-line, across the upper ply of the paper tube, which is afterward defined by the creaser-blade 107, and the creaser-groove 108, instead of carrying the secondary transverse folding-line backward over the primary transverse folding-line. In this new mode of operation the carrier oscillates inward from its normal position while it is coöperating with the tucker-plate to make the primary transverse fold and the inwardly-inclined triangular folds during the first half of that making and oscillates outward to its normal position while it is thus coöperating during the last half of that making, whereas in every prior machine the folding-bed which most nearly corresponds with the carrier of this machine does not thus oscillate while those folds are being made, but simply holds the lower ply of the paper tube against all oscillation while the upper ply is being turned over backward upon itself. It results from this new mode of operation that all the devices which act upon the paper to make the primary transverse fold and the inwardly-inclined triangular folds are moving forward while they are making them, whereas in the prior machines some devices which help to make those folds are moving backward at that time, and this new result is promotive of speed and also of some of the other superiorities which characterize this machine.

I claim as my invention—

1. The combination of a conveyer; an oscillating carrier having its forward end pivoted to the conveyer; mechanism to oscillate the carrier upon its pivot, and devices to coöperate with the carrier, during both parts of its oscillation, and during its forward movement with the conveyer, to unfold a paper tube, and to refold it into a paper-bag blank.

2. The combination of a conveyer; an oscillating carrier, pivoted to the conveyer; mechanism to oscillate the carrier upon its pivot, and a tucker-plate vibrating upon trunnions not substantially on a line with its defining edge; all coöperating during the forward movement of the conveyer, and during both parts of the oscillation of the carrier, and during the vibration of the tucker-plate, to unfold a paper tube, and to refold it into a paper-bag blank.

3. The combination of a conveyer; an oscillating carrier, pivoted to the conveyer; mechanism to oscillate the carrier upon its pivot, devices to hold the lower ply of a tucked-paper tube upon the face of the carrier; a tucker-plate vibrating upon trunnions not substantially on the line with its defining edge; and devices to hold the upper ply of a tucked-paper tube, against the face of the tucker-plate, between the line of its trunnions, and the line of its defining edge; all coöperating, during the forward movement of the conveyer, and during both parts of the oscillation of the carrier, and during the forward vibration of the tucker-plate to unfold a tucked-paper tube, and to refold it into a paper-bag blank, having inwardly-inclined triangular folds.

4. The combination of a rotating conveyer; two or more oscillating carriers, pivoted to the conveyer; mechanism to oscillate each carrier upon its pivot, and one set of mechanism placed and adjusted to coöperate with each of the carriers successively, during the forward movement of the conveyer, and during both parts of the oscillation of that carrier, to unfold a paper tube, and to refold it into a paper-bag blank.

5. The combination of a rotating conveyer; two or more oscillating carriers, pivoted to the conveyer; mechanism to oscillate each carrier upon its pivot; devices to hold the lower ply [illegible] carrier; a tucker-plate, vibrating upon trunnions not substantially on the line with its defining edge; and devices to hold the upper ply of a tucked-paper tube, against the face of the tucker-plate, between the line of its trunnions, and the line of its defining edge; all coöperating during the forward movement of the conveyer, and during both parts of the oscillation of each carrier, and during the forward vibration of the tucker-plate, to unfold a tucked-paper tube, and to refold it into a paper-bag blank, having inwardly-inclined triangular folds.

6. In a paper-bag machine the combination of the cylinder provided with a mutilation, the carrier pivotally mounted on that cylinder and means for imparting thereto an oscillatory motion by a cam and adapted to swing the same into the mutilation of the cylinder, the folding-surface of that carrier forming the continuation of the folding-surface of the cylinder, when the carrier is in its normal position, and devices coöperating with that carrier to effect the unfolding of the tucked-paper tube.

7. In a paper-bag machine the combination of the cylinder provided with a mutilation, the carrier pivotally mounted on that cylinder and means for imparting thereto an oscillatory motion by a cam and adapted to swing the same into the mutilation of the cylinder, the folding-surface of that carrier forming the continuation of the folding-surface of the cylinder when the carrier is in its normal position, and being provided with the front clip and the two oppositely-disposed side clips and devices coöperating with the carrier to effect the unfolding of the tucked-paper tube substantially as described.

8. In a paper-bag machine, the combination of a conveyer; an oscillating carrier pivoted thereto, and provided with means to hold the lower part of the tubular blank thereto; the tucker-plate provided with means to hold the upper part of the tubular blank; the parts combined and operating to distend and unfold the tucked-paper tube, while the carrier is oscillated, and operating means to cause the tucker-plate to vibrate and define the primary transverse folding-line across the blank; the whole operating to convert the blank into the diamond form, substantially as described, while the blank is carried onward by the conveyer.

9. In a paper-bag machine, the combination of a conveyer; an oscillating carrier pivoted thereto, operating means to cause the same to oscillate and means to hold the lower part of the tubular blank thereto; the tucker-plate trunnioned in the uprights and provided with the side nippers, operating means to cause the tucker-plate to vibrate, and means to close the nippers on the tucker-plate, all parts combined and operating to distend and unfold the tucked-paper tube and form the inside triangular folds while the carrier oscillates and the tucker-plate defines the primary transverse folding-line across the blank; the whole operating to convert the blank into the diamond form, while the blank is carried onward by the conveyer substantially as described.

10. In a paper-bag machine the combination of the conveyer, the carrier pivotally mounted thereon, operating means to cause the same to be oscillated, and the front clip and the two oppositely-disposed side clips arranged to swing down upon the lower part of the tubular blank and hold the same to the carrier, the tucker-plate trunnioned in the uprights and provided with the side nippers, operating means to vibrate the tucker-plate and operating means to cause the side nippers to swing down onto the tucker-plate and hold the upper part of the tubular blank, all parts combined and operating to distend and unfold the tubular blank to form the inside triangular folds while the tucker-plate defines the primary transverse folding-line across the blank, the whole operating to convert the tucked-paper tube into the diamond form, while the same is carried onward by the conveyer substantially as described.

11. In a paper-bag machine the combination of the cylinder provided with a mutilation, the carrier pivotally mounted on the cylinder, means for imparting thereto an oscillatory motion and a front clip and the two oppositely-disposed side clips, the tucker-plate trunnioned in the uprights and provided with the side nippers, and operating means to vibrate the tucker-plate so that the folding edge travels with the combined movement of the cylinder and the carrier in order to define the primary transverse folding-line substantially as described.

12. In a paper-bag machine the combination of the cylinder provided with a mutilation, the carrier pivotally mounted on the cylinder, means for imparting thereto an oscillatory motion and a front clip and the two oppositely-disposed side clips arranged to swing down upon the lower part of the tubular blank and hold the same to the carrier, the tucker-plate trunnioned in the uprights 23 and 24 and provided with the side nippers, and operating means to vibrate the tucker-plate so that the folding edge travels with the combined movement of the rotating cylinder and the oscillating carrier to define the primary transverse folding-line and unfold the tucked-paper tube into the diamond form while the blank is being carried onward substantially as described.

13 A folding-bed adapted to support one side of a paper-bag blank, a tucker-plate having a folding edge adapted to define the transverse folding-line across the blank on the other side of the blank and provided with trunnions, slides adapted to reciprocate on said trun-

nions, nippers pivotally mounted on the slides, the annular collar surrounding the slides, and operating means to carry the slides with the nippers laterally.

14. A carrier provided with means adapted to support and hold one side of a paper-bag blank, a tucker-plate having a folding edge adapted to define the transverse folding-line across the blank on the other side thereof and provided with trunnions mounted in the uprights of the machine with means to cause the same to be vibrated, the slides adapted to slide on the trunnions and carrying the nippers pivotally mounted thereon, the springs 92 for holding the nippers in the normally open position, the annular collar surrounding the slides and operating means for carrying the slides with the nippers laterally substantially as described.

15. A carrier provided with means to support and hold one side of a paper-bag blank a tucker-plate having a folding edge adapted to define a transverse folding-line across the blank on the other side thereof and provided with trunnions mounted in the uprights of the machine with means to cause the same to be vibrated, the slides adapted to slide on the trunnions and carrying the nippers pivotally mounted thereon, with the projection 83ª engaging the spline in the trunnions, means to cause the slides to oscillate, and means to cause the same to close and press on the tucker-plate all combined and operating substantially as described.

16. A folding-bed adapted to hold one side of a paper-bag blank, a tucker-plate having a folding edge adapted to define the transverse folding-line across the blank on the other side thereof, and provided with trunnions mounted in the uprights of the machine and means to cause the same to vibrate, the slides adapted to slide on the trunnions and carrying the nippers pivotally mounted thereon and the springs 92 for holding the nippers in the normally open position, projections 83ª engaging the splines of the trunnions and causing the same to vibrate with the trunnions and the tucker-plate; substantially as described.

17. A folding-bed adapted to hold one side of a paper-bag blank, a tucker-plate adapted to define the primary transverse folding-line across the blank on the other side thereof and provided with trunnions mounted in the uprights of the machine, the distance from the center-line of the trunnions to the folding edge of the tucker-plate being of substantially the depth of the tucks of the tube, operating means to cause the same to be vibrated, the slides adapted to oscillate on the trunnions and vibrate with the same and carrying pivotally mounted the bevel-edged side nippers, springs 92, to open the nippers when the projection 83ª is disengaged from the end of the spline, all combined and operating substantially as described.

18. In a paper-bag machine the combination of the conveyer, the carrier pivotally connected thereto, operating means consisting of a cam to cause the same to be oscillated, the plicators pivotally mounted on oppositely-disposed sides of the carriers and operating means consisting of a cam to cause the same to sweep over the traveling folding-bed of the carrier as the same is carried along by the conveyer.

19. In a paper-bag machine the combination of a cylinder, provided with a mutilation, the carrier pivotally mounted to the cylinder and means for imparting thereto an oscillatory motion, the plicators pivotally mounted in oppositely-disposed sides of the carrier, and operating means consisting of a cam to cause the same to sweep over the surface of the carriers directly back of the creaser-blade substantially as described.

20. In a paper-bag machine the combination of a cylinder, provided with a mutilation, the carrier pivotally mounted to the cylinder and means for imparting thereto an oscillatory motion, the plicators pivotally mounted in oppositely-disposed sides of the carrier, and operating means consisting of a cam to cause the same to sweep over the surface of the carriers directly back of the creaser-blade coacting with the transverse creaser-groove 109 as the carrier is propelled onward by the cylinder.

EDWARD K. CLAUSSEN.

Witnesses:
J. P. WAKEFIELD,
H. C. MARQUARDT.

200 *Clerk's Certificate.*

UNITED STATES OF AMERICA, *District of Maine, ss:*
UNITED STATES OF AMERICA, *District of Maine, ss.*

I, James E. Hewey, Clerk of the Circuit Court of the United States for the District of Maine, hereby certify that the seven volumes, entitled as follows:

Volume I., Complainant's Record, Prima Facie Proofs;
Volume II., Complainant's Record, Answering Proofs;
Volume III., Complainant's Record, Exhibit Book;
Volume IV., Defendant's Record, Continental Record, Volume I., Answer and Evidence;
Volume V., Defendant's Record, Continental Record, Volume II., U. S. Patents;
Volume VI., Defendant's Record, Continental Record, Volume III., Exhibits;
Volume VII., Proceedings in Circuit Court;

this certificate being attached to each of said volumes, contain and are a true copy of the record and all proceedings of said Circuit Court in the cause in equity entitled,

No. 546.

EASTERN PAPER BAG COMPANY, Complainant,
v.
CONTINENTAL PAPER BAG COMPANY, Defendant,

in said Circuit Court determined, the Petition for Appeal, Assignment of Errors, Supersedeas Bond on Appeal, Bond on Appeal, Opinion of the Circuit Court, and also the original Citation with acknowledgment of service thereon.

Witness my hand and the seal of said Circuit Court this thirty-first day of January, A. D. 1906.

[SEAL.] JAMES E. HEWEY, *Clerk.*

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CIRCUIT COURT OF THE UNITED STATES,

DISTRICT OF MAINE.

EASTERN PAPER BAG COMPANY

vs.

CONTINENTAL PAPER BAG COMPANY.

[Patent No. 558,969.]

Evidence taken on behalf of the complainant in rebuttal, before John A. Shields, Esq., United States Commissioner, acting as Special Examiner herein, pursuant to stipulation and agreement of parties herein, under Rule 67 of the Supreme Court for Courts in Equity, as amended, at the office of Betts, Betts, Sheffield & Betts, 120 Broadway, New York City, Borough of Manhattan, beginning Tuesday, July 21st, 1903, at 12 o'clock noon.

Met pursuant to notice.

Present—THE COMMISSIONER and SPECIAL EXAMINER.
SAMUEL R. BETTS, ESQ., Counsel for Complainant.
ALBERT H. WALKER, ESQ., Counsel for Defendant.

RUDOLPH M. HUNTER, a witness produced on the part of the complainant, having been first duly sworn to testify to the truth, the whole truth and nothing but the truth, testifies as follows:

[*Adjourned to July 23, 1903, at 11 a. m.*]

New York, July 23, 1903.

[*Met pursuant to adjournment.*]

Present—Counsel as before.

TESTIMONY OF R. M. HUNTER.

[*Direct examination by* Mr. S. R. BETTS.]

Q. 1. What is you name, age, residence and occupation?

A. Rudolph M. Hunter, 47 years; residence, Philadelphia, Pa.; occupation, mechanical engineer and solicitor of patents.

Q. 2. How long, about, have you been engaged in that occupation in Philadelphia?

A. Since about 1876.

Q. 3. Are you acquainted with William Liddell, now a resident of Brooklyn, N. Y., and if so, about how long have you known him and in what way did you first make his acquaintance?

A. I do not recall just how long I have known him, but probably the acquaintance dates as far back as 1893, and grew out of his work in connection with paper bag machines then being constructed in Philadelphia in connection with some inventions known as the Purvis inventions.

Q. 4. Referring more particularly to the period of the fall of 1895, state whether you did any professional work in connection with inventions of paper bag machines submitted to you or your office by said William Liddell, if so, state under what circumstances that work came into your office; what was its nature; what was done in your office to your knowledge, and by you personally in relation thereto; give dates connected with the matter and fix them by written memoranda, if possible; produce any letters, memoranda or papers from your office files bearing on this subject matter; and, in general, give a complete and full statement in regard to the work inquired about, how it was carried on to your knowledge and in what it resulted.

[*This question is objected to because it is not confined, in all its parts, to inquiries for facts within a knowledge of the witness, but includes inquiries into points which may be only hearsay. And defendant's counsel requests the witness, when answering the question, to make no statement whatever on any point outside of his personal knowledge.*]

A. I did do professional work for William Liddell, or rather in connection with inventions of paper bag machines, in the fall of 1895 and spring of 1896. The facts surrounding that work were substantially these: On September 16th, Mr. Haverstick of Ide, Haverstick & Company, wrote to me asking for an appointment to meet him and Mr. Liddell relative to some patent matters, which appointment was set for September 23d,

1895. The letter setting that appointment is dated September 17th, 1895, and is press copied in my letter press copy book on page 253, and reads as follows:

Sep. 17, 1895.

A. Haverstick, Esq.

Dear Sir:—

In answer to your favor of September 16th requesting the appointment of a time to meet Mr. William Liddell I would appoint Monday, September 23d, at 11 A. M., and I trust it will be convenient for him to be at my office.

Very truly.

In accordance with that appointment Mr. Liddell called at my office, 926 Walnut street, Philadelphia, and as I was busy at the time he was shown into the office of my brother, Mr. Ernest H. Hunter, who is associated with me in business. At that time I did not have any conversation with Mr. Liddell, but he left with my brother certain drawings in pencil on manila paper illustrating inventions of his in paper bag machines, and for which we were requested to apply for letters patent in his name as inventor. These applications were three in number, as were decided on, two of which were subsequently filed whereas the third had nothing done to it and was dropped from the start. In my ledger under the date of September 23d I find that these cases are entered as follows:

"September 23rd		Appli. Liddell paper bag machine, Case 1,	$65.00
"	"	Assgt. & Recdg. Fee, paper bag machine, Case 1,	3.00
"	"	Applics. Liddell paper bag mach., Cases A & B,	130.00
"	"	Assgt. & Recdg. Fee " " "	3.00"

In making these entries the item for the two applications mentioned together in the charge were originally called cases 2 and 3, but when the first application was dropped they were re-lettered A and B. I would further remark that the first two items relative to case 1 were cancelled by pencil lines drawn across them.

This letter appointing the interview and the entry of these charges on September 23rd fixes the date when Liddell called at my office and left the applications. It was my desire that my brother should have prepared the applications but as he was very busy on other matters he asked me to give them my special attention, and brought the manila drawings into my room and placed them on my desk, after showing me what they were. I at once sent for my draughtsman and delivered the drawings to him requesting that he should prepare from them suitable drawings for the Patent Office illustrating the invention which was purported to be shown in these Liddell drawings. I might say here that these two cases A and B ultimately resulted in Letters Patent No. 558,969 of April 29th, 1896, and No. 564,288 dated July 21st, 1896. The draughtsman worked on these drawings about the first part of October 1895, and appeared to have no difficulty with the drawings of Case B, which ultimately resulted in patent 564,288, but he had considerable difficulty in preparing the drawings for Case A because the Liddell drawings for that case were not so carefully prepared as were those drawings for Case B. In connection with the difficulty in the preparation of the drawings, I had occasion to desire to see Mr. Liddell to obtain further information to assist the draughtsman and in connection with this I had my brother dictate the following letter to Messrs. Ide, Haverstick & Company:

"Oct. 10, 1895.

Messrs. Ide, Haverstick & Company,

Gentlemen:—

The draughtsman who is preparing the drawings for Mr. Liddell's improvement in paper bag machines thinks that Mr. Liddell's drawings are not sufficiently complete in the matter of details to enable him to properly finish the drawings. I have therefore written Mr. Liddell requesting him to come over and explain these points to the draughtsman.

Very truly,

R. M. Hunter,

E. H. H."

Circuit Court of the United States,

DISTRICT OF MAINE.

IN EQUITY.

EASTERN PAPER BAG COMPANY,
Complainant,

vs.

CONTINENTAL PAPER BAG COMPANY,
Defendant.

ON LIDDELL PATENT, NO. 558,969.

VOLUME II.

COMPLAINANT'S RECORD.

ANSWERING PROOFS.

Betts, Betts, Sheffield & Betts,
Solicitors for Complainant,
120 Broadway,
New York City.

At the same time I requested that a similar letter should be sent to Mr. Liddell and this was done on October 10th, 1895. The letter to Mr. Liddell reads as follows:

"Oct. 10th, 1895.

William Liddell, Esq.,

Dear Sir:—

The draughtsman who is making the drawings in connection with your paper bag machines thinks that it will be necessary to have some further explanation from you with regard to the details of construction before he can complete the drawings. I would therefore ask you to come over here for the purpose of making the necessary explanations to him. Please let me know when you will come.

Yours truly,

R. M. Hunter,

E. H. H."

These two letters of October 10th are press copied on page 348 of my letter press copy book of 1895. It appears that Mr. Liddell replied to the letter of October 10th agreeing to come over to Philadelphia on the Tuesday following October 12th, as under date of October 12th, 1895, the following letter was sent from my office to Mr. Haverstick:

"October 12, 1895.

Albert Haverstick, Esq.,

Dear Sir:—

In answer to your letter of yesterday with reference to the Liddell patent cases I beg leave to say that the expiration of the agreement with Mr. Liddell on October 15th cannot in any way affect your right to assignments of his improvements now in our hands. We regret that we have been delayed owing to the inability of the draughtsman to complete the details from Mr. Liddell's drawings. Mr. Liddell has written me that he will be here on Tuesday to go over the matter with the draughtsman, and we will then push the matter without delay. As he has already placed the cases in our hands recog-

nizing that he was bound to do so under his agreement with you, the expiration of your agreement with him on October 15th cannot affect your rights.

Very truly,

R. M. Hunter,

E. H. H."

This letter was press copied on page 353 of my letter press copy book for October, 1895.

In accordance with the understanding Mr. Liddell came over to Philadelphia and called upon me at my office, the said visit being on the Tuesday following the 12th of October, as near as I can place it, and after explaining to me in a general way what was required in connection with the drawings of Case A, which were the ones the draughtsman found the difficulty in preparing, I told Mr. Liddell that I thought it would be best for him to go to the draughtsman himself and explain to him what it was he desired should be shown. At that interview I understood that certain cams were to be employed for the purpose of oscillating the pivoted arm carrying the folder plate and also to operate the folder plate as well, but thinking that Mr. Liddell would get everything straight with the draughtesman I did not at that time have him make for me any sketches. Whether he made any sketches for the draughtsman I do not know. After seeing the draughtsman, Mr. Liddell went back home and the draughtsman proceeded with his drawings, but was still unable to complete the drawings of Case A, as he did not seem to remember just what it was that Mr. Liddell desired should be incorporated in the construction to impart the necessary movement to the folder plate and oscillating arm. He stated to me, however, that these parts were to be operated by cams, and while in a general way he seemed to have a knowledge of the invention of Mr. Liddell, he still lacked the exact lines to place upon the drawing to complete it, and for this reason the preparation of the case was delayed. The main work on the drawings was, however, done by October 28th, 1895, as on that date the draughtsman made a charge against my office in connection with the drawings of those cases A and B.

As the contract of Liddell with Ide, Haverstick & Company had expired on October 15th, and as he showed no disposition, as I understood it at the time, to interest himself about these cases, my clients were very anxious to have the applications executed so that they could be filed in the Patent Office at the earliest possible date. Notwithstanding that the drawings of Case A were still defective, I nevertheless drafted the specifications setting out and claiming the generic invention embodied in the machine and forwarded the same to Mr. Haverstick, at the same time pointing out wherein defects occurred and upon what points further information would be necessary. Also knowing that he had no claim upon the time of Mr. Liddell at that time and not desiring to let any opportunity pass to get the signature of Mr. Liddell to the applications, I requested Mr. Haverstick to have Mr. Liddell execute the application in the form I sent it In this way we would at least get his signature to the application and if we succeeded in securing his attention later on when the other case was ready I intended to have him execute both cases at the same time in complete form. With this object in view I wrote the following letter to Mr. Haverstick:

"Mr. Haverstick,
c/o Ide, Haverstick & Co.

Dear sir:

I enclose you the application of Case A which Mr. Liddell last left with me. The draughtsman has had a very hard time to unravel the details, and, notwithstanding that parts are still wanting, I have written the specification making a memoranda of those parts which I still need information upon, said memoranda being annexed to the specification. The papers are sent in rough so that Mr. Liddell can execute the application and we can add the corrections in recopying. The other application will be forwarded to you very shortly.

The unavoidable delay in these matters of Mr. Liddell, you will understand, arise out of the incompleteness of

the memoranda which he leaves with me, but I trust that the delay in this instance will not inconvenience you.

Very truly,

R. M. Hunter,
W. L. E."

This letter is press copied on page 268 of my letter press copy book for January, 1896, and while it does not appear to be dated it occurs between press copies of letters dated January 3rd, 1896, and January 4th, 1896. To determine which of these dates was the date of the letter I examined my mail book and find that the letter was mailed to Mr. Haverstick on January 3rd, the entry being as follows:

"Jan. 3. Mr. Haverstick spec. Assignment 3 b. prints — Instructions and letter case of William Liddell."

At this time the Case B was also prepared and ready for execution and was retained in my office as Mr. Haverstick had arranged to bring Mr. Liddell to Philadelphia so as to finish up and execute the two applications. On January 7th, 1896, Mr. Liddell came to my office and went over his cases with me and decided upon all points, and the papers were completed and he executed them while in Philadelphia. I fix this date by the fact that the applications were executed on that date, January 7th, 1896, before my brother who was the Notary Public in my office, and also by the fact that I made a charge under that date, January 7th, 1896, for the time that I gave to Mr. Liddell in connection with the changes which he desired to have made on the drawings. That entry appears in my ledger as follows:

"1896.

Jany. 7, "Extra drawings in laying out cams and movements case A. Expert, $10.00"

The cases were executed on January 7th, as above pointed out, and were filed and subsequently issued as Letters Patent, Case A, issuing as Letters Patent 558,969, dated April 28th, 1896, and Case B, issuing as Letters Patent No. 564,288 dated July 21st, 1896.

Having now stated the various transactions and dates with respect to the preparation and filing of the two applications of

Liddell, in consecutive order in which the transactions took place, I will explain a little more in detail what these difficulties referred to in Case A were which caused the trouble and delay in preparing the case. When Mr. Liddell left the cases to be prepared I understood that there were certain differences between the two applications which in the one case involved a reciprocating bed and in the other case a rotary bed or cylinder upon which the paper tube was fed and conveyed through the machine. I also understood that in connection with these two types of beds it was Mr. Liddell's intention to combine a suitable folding plate, which folding plate was to be hinged at a distance from its folding edge and to have such a motion that it would turn over or oscillate upon the forward transverse edge or end of the plate, at the same time maintaining said end or edge in close position relative to the traveling bed and also to move with said bed with a speed commensurate with the same, with the object in view of folding the tube end in the proper manner while in the custody of the traveling bed. I distinctly understood that it was immaterial whether the folding plate was made to oscillate back and forth or to rotate completely around in the return movement, as the only important feature in connection with this plate was that it should maintain a proper relation and movement relative to the bed during the time in which it is acting upon the bag tube. Case B involved the construction of the reciprocating bed, whereas Case A was intended to disclose the rotating bed. The Liddell drawings for Case B were more completely made than were the drawings for Case A, and in these drawings for Case B the folding plate is shown as one having an oscillatory movement without a complete rotary movement. Whether the original drawings of Liddell illustrating Case A were intended by him to disclose a forming plate which only oscillated or one which was to be given a complete rotary movement cannot now be fully determined because those drawings have been lost and the most diligent search throughout my offices and through the offices of the draughtsman did not bring any of the drawings to light. Whether they were returned to Mr. Liddell or not I do not know, but it is quite certain that they do not exist at the present time to my knowledge.

I personally examined all of the drawings in the draughtsman's rooms and could find no trace of any one of them. I am, however, enabled to produce a copy of the drawing which the draughtsman made from the Liddell drawing Case A before it was altered to cure the defects which were referred to in the various letters which I have quoted upon the record. This copy is a blue print of the drawing and was annexed to the application papers when I sent them to Mr. Haverstick on January 3rd, 1896, and I can only presume that this blue print correctly illustrated what the draughtsman found on the manila drawing of Mr. Liddell and that, whatever other instructions he had been given relative to cams, he had forgotten. This drawing shows the pivoted arm F which carries the forming plate E combined with a spring F′ to move its free end towards the revolving bed but does not show any mechanism for moving it away from the bed. Upon the axis *f* of the pivoted arm F is shown an eccentric gear, and upon the shaft L is another eccentric gear K meshing with the other eccentric gear first mentioned. No cam is indicated for moving this arm F, yet it was clearly understood that a cam device of some kind was to be used. As the drawing did not seem to be complete, but as I was anxious to have the application prepared and submitted so that we could obtain the signature of Liddell I wrote up the specification, treating the defective drawing in the only manner in which I could treat it without assuming the addition of any parts. At the same time, knowing that the drawing was not complete I placed question marks in the margin of the specification at those places which I considered incomplete and incorrect and attached a memorandum to the application papers pointing out what additional information it was necessary to have to make the specification complete as to the details. In doing this I fully realized that the real invention involving the operation in the generic sense was disclosed and claimed in the claims as I prepared the application in the first instance, and there has been no material change in those claims in the patent as issued. As I understood from Mr. Liddell that the arm F was to be operated by cam devices, I wrote the specification assuming that the eccentric gears might have been made as gears by the

draughtsman instead of cams, so that without changing the drawing I described these gears or cams as follows:

> "E is a forming plate and is hinged at *e* to the arm F journaled to the main frame at *f*. This arm is drawn toward the cylinder C by a spring F′ and is moved away from the cylinder about the axis *f* by gears K.
>
> L is a rotating power shaft and is driven by a belt pulley L′ and operates the cylinder C by gears M2, M3. Spur gears M′ M N operate the axis *e* of the forming plate E when the arm F is moved. Of these gears M′ is fixed and hence when the arm F is moved its gears M work upon M′ as if it were a rack. This causes motion to the plate E about *e* as an axis."

And further on in the specification I further stated with reference to the arm and the forming plate:

> "The gear M′ is stationary and as the arm F is oscillated about *f* as a centre the intermediate gear M and gear N causes a proper rotation or oscillation of the plate E about *e* as a centre. The movements of the arm F are governed by the cam gears K K and is so timed that while permitting the oscillation of the plate E about its axis *e*, it insures the edge W moving exactly at the same speed of the surface speed of the cylinder C so as not to displace in any manner the tube."

These several parts of the specification, while literally based upon what was shown in the original drawing as made by the draughtsman and a blue print copy of which I have before me, were not considered by me at the time to be exactly correct as indicated by my letter to Mr. Haverstick, and in the margins of the specifications adjacent to these parts I placed question marks showing that I wished further information regarding the mechanism for producing the operation and as called for by the memorandum attached. I have not this memorandum and do not know what became of it. I endeavored to draw the specification upon what was shown in the drawing prepared from Mr. Liddell's drawings, and had no desire or intention of supplying

anything not authorized directly by him, though it would have been quite easy for me to devise means for properly carrying out the operations, I sent the specification and copy of the drawing in the defective form to Mr. Haverstick, requesting that he have Mr. Liddell furnish me with the additional information necessary.

When Mr. Liddell came to Philadelphia on January 7th, 1896, I went over the case with him and made the changes in the drawings and specification which appear between the original draft and the patent as issued, under his direction and instruction. That Mr. Liddell fully understood how to make the forming plate oscillate in its operation of forming the bag is clearly evidenced by Case B (Patent No. 564,288); and while he may also have had in his mind the idea of rotating the forming plate about its axis *c* he considered these special movements, so far as they secured the return of the plate to its initial position, as unimportant and immaterial, as is evidenced by the language immediately preceding the claims which reads as follows:

> "It is evident that the mere mechanism for securing the several movements to the different parts may be modified or changed in various ways without departing from the spirit of the invention, and I do not, therefore, confine myself to the details of construction here shown."

The changes which were made in conformity with Mr. Liddell's instructions eliminated the eccentric or cam gears K and substituted the addition of a short arm to the arm F and a cam K′ to operate it, and also the addition of a second cam K and the parts *k k*2 to modify the movement of the gear M′, as shown in Fig. 1 of the patent. It also involved the modification shown in Fig. 9 contemplating the use of the bag tubes shown in Figs 10, 11 and 12. These changes required but very few words of modification to the specification as originally prepared, and these changes are indicated in red ink in my office files. The changes in the drawings were made in pencil at the time Mr. Liddell was in Philadelphia, and when the application papers were prepared and executed by him, and my charge (before

placed on the record) under the date of January 7th, 1896, was made for the time given in connection with these changes. Whether the pencil lines that I placed upon the drawing under instructions from Mr. Liddell were inked on that particular day I am not able to say, as the inking of them was done by the draughtsman; but they were in no sense changed from the arrangement as placed thereon by me under Mr. Liddell's instructions on January 7th, 1896.

It does not seem to me that there is any material difference in results or operation, whether the forming plate E merely oscillates or is rotated, for its movement relatively to the forming bed and its action upon the paper tube in the making of the bag is precisely the same in both instances. The mere details for securing the mechanical movement to the folding plate were not considered by me or by Mr. Liddell as important. It will be observed that there are no claims drawn to cover such mechanism specifically, and for this reason the claims as originally presented were in proper form to cover the invention even after the mechanical movements or devices that produced them had been modified in accordance with Mr. Liddell's instructions on January 7th, 1896. Had Mr. Liddell instructed me to have left the drawing in the form which it was when the original draft was prepared and to have merely added a short arm to the lever F and a cam to operate it, that change would have been made instead of the changes which were made, as it would have been totally immaterial to me what changes he wished to have made, and furthermore, it would have been perhaps simpler to have made them. It would, however, have necessitated the plate E rotating instead of oscillating, and it may have been that on mature consideration Mr. Liddell preferred to have it oscillate, as in his case B. At all events, the mechanism was changed to make it oscillate under his instructions.

After having the cases executed by Mr. Liddell they were forwarded to Washington, but by some oversight the sheet of drawing of Case A, which contained Figs. 5, 6, 7 and 8, had not been signed by me and it was returned for signature, which delayed the official filing date and gave to the Case B the prior

record date. As the files show, Case B received considerable opposition on the part of the Patent Office, whereas Case A was deemed allowable as presented and the case allowed.

[*Defendant's counsel objects to the long answer to Q4 in so far as it contains secondary evidence of documents, books, entries, or copies of letters or documents; and defendant's counsel also objects to all those portions of the answer which are based on hearsay and all those portions which are based on presumptions and inferences. And further, counsel objects to the whole answer because those objectionable parts are so numerous and are so mixed up with statements which if standing alone would be admissible, that the whole answer is inadmissible on behalf of the complainant.*

Q5. You have testified that these two cases called applications A and B were sworn to at your office by Mr. William Liddell on January 7, 1896, but the B Case was not filed until January 21, 1896, and the A Case was not formally given a filing date until Feb. 6, 1896. Can you state when these cases were actually sent from your office to the Patent Office?

A. They were both sent in January, 1896, and as near as I can tell Case B was sent on January 20th, 1896, and Case A on January 27th, 1896. As near as I can recollect the reason the cases were not filed earlier was that the fees were not paid upon them and my office was possibly short of ready cash at the time. While Mr. Haverstick promised to send the fee promptly, as he always did, as a matter of fact he did not send it until January 28th, 1896. As before stated, the reason why Case A did not have a record date for filing until February 6th, 1896, instead of in January, was due to the fact that the drawings were not properly signed and witnessed. According to the Patent Office Letter of January 28th, 1896, it stated, "Your application for a patent will be taken up for examination in its "order upon receipt of drawing signed and witnessed. Drawing on file will be returned for correction upon request."

[*Complainant's counsel offers in evidence the two separate files produced by the witness* HUNTER *as his office files of Case A (application for patent in suit) and Case B, respectively,*

and about which he has testified above, and said files are marked respectively Complainant's Exhibit, "Hunter File of Case A" and "Complainant's Exhibit, Hunter File of Case B," J. A. S., Special Examiner, July 23, 1903.

[*Defendant's counsel objects to Hunter File Case B, as immaterial in this suit, and objects to all parts of Hunter File Case A except the four blue prints therein and the Patent Office letters of Jan. 28th, Feb. 6th, March 17th and April 3rd therein, as not having been properly proved. Defendant's counsel does not object to the first or second blue print in Hunter File Case A and does not object to the third or fourth blue print in Hunter File A, as those blue prints appear to have been on their faces originally made. But defendant's counsel does object to the pencil changes and the ink changes which appear to have been made at some time in the past upon the faces of the third and fourth blue prints in Hunter File Case A.*]

Adjourned to 10:30 A. M., July 24, 1903.

New York, July 24, 1903.

[*Met pursuant to adjournment.*]

Present—Counsel as before.

RUDOLPH M. HUNTER, testimony continued:

Q. 6. Please look at Complainant's Exhibit Hunter File Case A, and especially at the two sheets of blue prints therein containing Fig. 1, and state more in detail than you have done how it happened that there were two sheets of blue prints containing that Fig. 1 and under what circumstances and in what relation of time they were made, and why one of those sheets contains figures additional to Fig. 1 and from what original sheet of drawings those blue prints were made and how that original was utilized?

A. Sheet 1 of the drawings of this application, when originally made from Mr. Liddell's drawings was exactly as shown in the blue print referred to in your question which contains only Fig. 1. This was the blue print which was annexed to

the application when sent to Mr. Haverstick, but which I pointed out in my communication to him and in my notes annexed to the specification was incorrect. After going over the matter with Mr. Liddell on January 7th, 1896, the Patent Office drawing was changed to suit his instructions and the changes consisted in erasing the two eccentric gears and substituting the cams and part *k*1 *k*2 shown in the corrected drawing, and also by adding the little figures 9 to 11.

The second blue print referred to in the question containing Fig. 1 and also Figs. 9 to 11 was made from the original sheet of drawing when corrected. When the blue print was sent to Mr. Haverstick it did not contain either the pencil lines nor the red lines which now appear upon it, these having been put on it after its return. As above pointed out, only one sheet of drawing containing Fig. 1 was made and this drawing when corrected as shown in the blue print, which contains Figs. 9 to 11, was the one which was sent to the Patent Office.

[*Direct examination closed.*]

Cross examination by Mr. WALKER:

x-Q. 7. Am I right in understanding that the drawings of the Liddell application Case A, as those drawings existed prior to January 7th, 1896, are correctly represented by the first three blue prints which are contained in Complainant's Exhibit Hunter File Case A, and which three sheets of blue prints contain Figures 1, 2, 3, 4, 5, 6, 7 and 8, and do not contain Figures 9, 10, 11 and 12; and am I also right in understanding that prior to January 7th, 1896, that blue print which contains only Figure 1 did not have thereon any pencil marks or any red ink marks or any other marks except the white lines and characters which were produced photographically from the original sheet of drawing as that drawing existed prior to and up to January 7th, 1896?

A. Yes, you are right.

x-Q. 8. Am I also right in understanding that after January 7th, 1896, the original drawing (from which the original

blue print which contains only figure 1 was made) was changed into the condition shown by that blue print in Hunter File Case A which contains figures 1, 9, 10, 11 and 12, as that blue print existed before the reference letters which now appear thereon in ink were placed upon that blue print; and am I also right in understanding that after the last mentioned blue print was made from that changed drawing, that drawing was still further changed by adding thereto in figure 1 the reference letters K, K1, *k*1, *k*2, and by adding thereto in eleven different places the reference letter W; and also by adding to the gear M1 of Fig. 1 three dotted lines and two small circles to indicate that the arm connecting the link *k*2 with the gear M1 was to be connected thereto by being riveted or bolted through it between the teeth and the axis of the gear; and also am I right in understanding that after the last mentioned blue print (namely, the one containing figures 1, 9, 10, 11 and 12) was made from the changed drawing the signature of William L. Evans was written by him under the signature of Henry Drury upon that drawing?

A. I cannot answer this question categorically as it is too involved, but will answer the separate queries separately. In the first place, the drawing was not changed after January 7th, 1896, but was changed by me on January 7th, and these changes I made in pencil myself and also placed upon them letters of reference in pencil. As before stated, I am not able at this time to say whether the lines were inked by the draughtsman on January 7th or immediately after. With regard to your second query, it is quite possible that the letters of reference may have been inadvertently erased by the draughtsman when cleaning the drawing and were placed on the drawing after the blue print was made as mentioned in your question. With regard to your last query, it is quite evident that the signature of Wm. L. Evans was placed on the corrected drawing after the second blue print was made.

x-Q. 9. Now in order to avoid possibility of error and confusion, let us call the third blue print in Hunter File Case A (namely, the blue print which contains only Fig. 1) the first blue print; and let us call the blue print in Hunter File Case A which contains Figs. 1, 9, 10, 11 and 12 the second blue

print; and let us speak of the sheet of drawing from which both of those blue prints were made as that drawing existed when the first blue print was made from it, by the name of the original drawing; and let us call that drawing as it existed when the second blue print was made from it the changed drawing; and let us call that drawing as it was finally filed in the Patent Office on February 6th, 1896, by the name of the Patent Office drawing. With that understanding, please to state the name of the draughtsman who made that original drawing?

A. Henry Drury.

x-Q. 10. Did Mr. Drury work in your office in Philadelphia in January, 1896, or did he work in some other office in that city?

A. He worked in his own office, 712 Walnut street.

x-Q. 11. About how far was his office away from your office?

A. About two blocks and a half.

x-Q. 12. When you first saw the original drawing, was it in pencil or had it been inked in?

A. That I cannot recall, because so frequently the drawings are shown me in pencil while equally frequently they are completed and inked before return to me.

x-Q. 13. Was the first blue print made by Mr. Drury in his office, or was it made by somebody in your office?

A. To the best of my recollection it was made by Mr. Drury.

x-Q. 14. That first blue print shows, does it not, that when it was made from the original drawing, that drawing had been provided with a full set of reference letters in ink?

A. That is correct.

x-Q. 15. Now I think I can reliably infer from your testimony the following points of fact, and I will ask you whether I am correct: Mr. Drury first made the original drawing in pencil and then inked it in without any letters of reference and delivered it to you, you thereupon prepared the first draft of a specification to go with that first drawing and with those sheets of drawings which contained figures 2, 3, 4, 5, 6, 7, and 8. That first draft of the specification is contained in the last nine pages of Hunter File Case A, as those pages appear in purple type-

writing without the pencil changes and without the red ink changes which now appear upon those nine pages of typewriting. Thereupon you corrected that purple draft by adding thereto the pencilled words which now appear thereon. You also inserted in pencil on the original drawing the reference letters to correspond with your draft of the specification. You then sent that original drawing back to Mr. Drury with the words, "William Liddell by R. M. Hunter" written by you in the lower right hand corner thereof. Thereupon Mr. Drury inked in the reference letters which you had made in pencil upon the drawing and he also wrote his name under the word "Witnesses" at the lower left hand corner of the original drawing. Then he made the first blue print from that original drawing and returned that original drawing and that blue print to you. Thereupon you re-examined the case and saw that the drawing showed no means for moving the arm F up and down, while the plate E would be revolving around the shaft *c*.

A. Your statement is substantially correct excepting that it may imply that I did not see the deficiency in the drawing, until after the blue print was made, whereas it is a fact that I knew of the defect when I first saw the drawing and when I prepared the first draft of the specification. I desired to send the papers to Mr. Haverstick and therefore prepared the original draft of the specification and a blue print of the drawing as it then existed, and at the same time called the attention of Mr. Haverstick to the fact that the specification and drawing contained defects to which a memorandum referred which I annexed to the papers when sent to him. I have explained this in my direct testimony.

x-Q. 16. Now please to look at Liddell drawing No. 1 (which is in evidence in this case), and compare it with the first blue print, which was made from the original drawing of which we are speaking; and having made that comparison please to state whether Liddell drawing No. 1 contains an arm F′ and a cam K′ for rocking the arm F; and also whether the original drawing, which was made by Mr. Drury, could not have been completed by simply adding such an arm F′ to the arm F of that drawing and by simply adding such a cam K′ to that drawing

ly placing it upon the shaft L of that drawing and by so adjusting and forming its working edge as to enable it to rock the arm F in the way which you found that arm must be rocked when you first saw the original drawing made by Mr. Drury?

[*Objected to as not proper cross-examination, not founded on the direct and calling for matter of expert opinion. This witness has not been called as an expert to tell what could or could not have been done either as expert or as a matter of fact.*]

[*Question withdrawn.*]

Q. 17. When Mr. Drury first delivered the original drawing to you it conformed to the first blue print, did it not, except in not having any signatures or any letters of reference thereon?

A. That is correct.

Q. 18. It is true, is it not, that when you proceeded to prepare the first draft of the specification (which comprises the matter in purple typewriting in Hunter File Case A), you saw that the original drawing was incomplete in that while it showed two eccentric gears and four true gears for revolving the plate E it did not show any mechanism for causing the arm F to rock on the shaft *f* so as to give the plate E room to turn forward from the position shown in figure 1 with the forward movement of the cylinder C as shown in that figure?

A. Your assumption is incorrect. I did say, however, it lacked certain mechanism but I had no information that the eccentric gear were to revolve the true gears as specified in your question. I did, however, understand that the arm F was to be oscillated against the action of the spring by a cam device. I did not assume that there were to be any additions to be made to the drawing, but that perhaps some of the parts shown in the drawing were incorrect. For the purposes of completing a draft of specification to forward to Mr. Haverstick I assumed that the eccentric gears were to act as cams and that that upon the shaft *f* was rigid with respect to the arm. Assuming that the part K therefore was intended to actuate the arm F as a cam I did not assume that it was also to operate directly upon the true gears. This was my assumption when I drew the original draft of specification, and on those portions of the specification I placed question marks and also added a memorandum calling

Mr. Haverstick's attention to the apparent defects. With respect to the true gears the original draft of specification assumed that the gear M′ was stationary and that the movement of the arm F caused the other gears M to rotate upon M′ as a rack to produce an oscillation of the forming plate as intended in the Liddell Case B. These were the assumptions that I made when drawing the original draft, as may be seen by reading it.

x-Q. 19. From what source did you receive the idea that the true gear M′ was to be stationary when you first examined the original drawing which Mr. Drury made?

A. If I assumed that the gear M′ was to be rotated by the eccentric gears K there would have been nothing to oscillate the arm F, and I therefore assumed that the draughtsman had incorrectly shown the eccentric K as a gear instead of as a cam. The movement which I assumed for the parts would have caused the forming plate to operate in accordance with the corresponding plate in Liddell Case B and would make the two cases distinguish one from the other, in that Case A has a continuously revolving bed, whereas Case B had a reciprocating bed.

x-Q. 20. When you first examined the original drawing, did you understand that the pulley L′, the shaft L, the gear M2 and the eccentric gear K were all to revolve together upon the axis L?

A. I presumed that was the intention and so described them.

x-Q. 21. At that time did you understand that the second eccentric gear (which is not lettered in the first blue print, but which is shown as meshing with the eccentric gear K), was to revolve around the shaft *f* as an axis?

A. I could not have understood that because in the original draft I described the action of these parts as intended to rock the arm F, and if they were to rock the arm F the eccentric gear on the axis *f* could not revolve around it. The mechanism was defective upon its face if these parts were to be considered as gears.

x-Q. 22. When you first examined the original drawing which Mr. Drury made, did you infer therefrom that the arm F was to be rocked from the shaft L by means of some inter-

mediate mechanism or other and that the plate E was to receive its motion from the train of gears M M and N which train of gears were to receive their motion by the rack action of the first of them upon the gear M'?

A. That is all the impression that I could derive from examining the drawings and that is the understanding as stated in the original draft of specification which I prepared at that time.

x-Q. 23. Did Mr. Drury send the original drawing to you when he first delivered it to you or did he carry that drawing to you in person?

A. I do not know, but he did make an attempted explanation of what he understood the mechanism shown in the drawings was to perform and I only had that to go on at that time, as I did not wish to change anything from what was shown in the drawings.

x-Q. 24. Did Mr. Drury's explanation of what he understood the mechanism shown in the drawing was intended to perform agree with the understanding which you say in reply to x-Q. 22 you had at the time you made the original draft of specification?

A. I have no doubt but that that was the understanding, or at least all the understanding, that he had at that time: but both he and I realized at that time that the drawing was defective in some particular.

x-Q. 25. You knew perfectly well at that time, did you not, that the two eccentric discs upon the shafts L and *f* respectively were shown as gears upon the original drawing?

A. I did.

x-Q. 26. Was it your opinion at that time that that showing was somehow a mistaken one and that neither of those gears was suitable for the work of rocking the arm F because they must revolve continuously in one direction, whereas any instrumentality that would rock the arm F must rock first in one direction and then in the other?

A. That was my impression, but as I understood that a cam device of some kind was intended to rock the arm F and as nothing else appeared to be on the drawing to do it, I described its movements as being accomplished by these gears. For instance, I used the following statement in the original draft:

"This arm F is drawn toward the cylinder C by a spring F′ and is moved away from the cylinder about the axis *f* by gears K."

And in the margin adjacent to this statement I inserted a question mark.

x-Q. 27. In using that language in the original draft and in speaking of "gears K," did you mean to include the gear which has that letter upon it in the first blue print and also the corresponding gear from which that letter was omitted but which is shown as meshing with the gear which is lettered K?

A. I presume that I did, but it is immaterial because it is quite evident that while so describing the parts and their actions I did not consider them correct as pointed out by me.

x-Q. 28. It is true is it not, that wherever the original draft of the specification speaks of the gears K it refers to the two eccentric gears, one of which has the letter K upon it and the other of which did not happen to get lettered?

A. Yes, that is correct.

x-Q. 29. When you first examined the original drawing and recognized the fact that it contained no mechanism which was suitable for rocking the arm F, why did you not spontaneously discard its unsuitable gears K and substitute a cam upon the shaft L and an arm connected with the arm F and worked by that cam, and thus provide a mechanism which would rock the arm F?

A. Because it is not my province to make any changes in an applicant's structure from what is shown in the drawing without his instructions. I treated the matter which was shown as if it were a cam device to operate the arm because of the eccentric character of the parts which we have called gears K. While I was at liberty to use my own language to describe what I understood was intended to be illustrated in the drawings, I did not consider that I had any right to make any changes in the drawings which might be considered material without the sanction and instructions of the inventor.

x-Q. 30. It is true, is it not, that you are yourself a far more distinguished and prolific inventor than William Liddell ever was?

A. That is a matter of opinion, but it is true that I have made a great many inventions, and very few persons have more patents on their inventions, but that would make me all the more careful not to change another inventor's ideas or mechanisms in preparing an application, without his instructions.

x-Q. 31. About how many letters patent of the United States have been granted on your invention and application therefor?

A. I do not know, but possibly it is about three hundred.

x-Q. 32. Those patents have been granted in what arts?

A. Very largely in the electrical arts.

x-Q. 33. About how many of them relate to mechanical machinery as distinguished from electrical apparatus?

A. I really could not say, as nearly all inventions involve mechanical devices of some character except in those cases that are purely chemical processes.

x-Q. 34. Prior to January 7th, 1896, you had prepared the applications for a large number of paper bag machine patents, had you not?

A. I had prepared some many years before, but the various paper bag machine cases that had been patented through my office for a number of years prior to 1896 had invariably been prepared and attended to by my brother, E. H. Hunter.

x-Q. 35. On January 7th, 1896, and long prior thereto you had been a skillful mechanical draughtsman, had you not, so that you could have made the drawings for the Liddell cases, including those shown in Complainant's Exhibit Hunter File, Case A, quite as well as Mr. Drury could do that work, if you could have spared time for practicing that part of your profession?

A. Yes, that is correct.

x-Q. 36. Now, when you first examined the original drawing, you did, as you have stated, acquire the idea that the gear M′ was to be stationary. Did it not thereupon occur to you that that gear must rock somewhat at times in order that it might impart to the gears M and N a modification of the rack movement which those gears would receive from the rising and falling of the arm F, and in order that the resultant movement of the working edge of the plate E might be equal in

speed to a line drawn across the cylinder C under that working edge?

A. I do not know that I gave any particular consideration to that point at the time because I felt that the drawing was defective and all that I intended to do at the time was to prepare a specification based upon what I found in the drawing to submit with the blue print of the drawing to Mr. Haverstick and Mr. Liddell, leaving whatever changes were to be made to be determined upon after Mr. Liddell had gone over the matter.

x-Q. 37. Was it not perfectly plain to you when you first saw the original drawing which Mr. Drury had made that the mechanism thereof would be inoperative either to rock the arm F or to properly oscillate or to revolve the plate E?

A. I appreciated that it was hardly suitable for carrying out the operation of the parts as described in the original draft of the specification, and it was because of this fact that I was very careful to put question marks in the margin in three places and to direct attention to this defect by a memorandum which I attached to the case when sending it to Mr. Haverstick.

x-Q. 38. Was it not perfectly plain to you when you first saw the original drawing which Mr. Drury had made that the mechanism thereof would be totally inoperative for any purpose, because the continuous revolution of the pulley L1 would impart a continuous revolution to the eccentric gear which turns around the shaft *f*, and because that continuous revolution in not more than one-half of one turn would raise the arm F and turn it over backward upon the gear M2 or the gear K or upon the shaft L, whichever one of those things would first stop the rotation of the arm F around the shaft *f*?

A. That is all true if the eccentric parts K are required to be considered as gears.

x-Q. 39. Now, however unwilling you might have been to change the original drawing without the consent of Mr. Liddell, it is true, is it not, that it was impossible for you with your exceptionally inventive and alert mind not to immediately think how the arm F might be made to rock by means of a cam and an arm by means of discarding the eccentric

76 gears K of the original drawing, as soon as you examined that drawing with a view to writing a description of it or dictating the draft of the original specification?

A. That is true, and in writing the specification I very clearly indicated that while I did not change the drawing as to the parts K I designated them as "cam" gears, implying that there was a cam action somehow produced by them upon the arm F to secure its oscillation.

x-Q. 40. After the first blue print came back from Mr. Drury you reconsidered the case, did you not, to the extent of reading through the draft of the specification in connection with that blue print and also amending that draft as it is shown to be amended in pencil, though not as it is shown to be amended
77 in red ink?

A. The pencil amendments were made before the drawing went back to Drury to be blue printed.

x-Q. 41. When the original drawing came back with the first blue print from Drury, did you give any more study to the case before you sent the draft of the specification with its pencilled amendments and with the first blue print to Mr. Haverstick?

A. Not that I recall.

x-Q. 42. Who brought that draft and that first blue print back to you?

A. Mr. Liddell brought it back, and I am not positive whether Mr. Haverseick came with him, though it is possible that he did. This was on January 7th, 1896.

78 x-Q. 43. What time in the day of January 7th, 1896, did Mr. Liddell reach your office?

A. I do not recollect exactly, but think it was in the morning.

x-Q. 44. Do you remember positively whether Mr. Haverstick was in your office on that day or not?

A. That I cannot state positively.

x-Q. 45. How long before that day was it that you sent the draft of the specification and the first blue print to Mr. Haverstick?

A. It was on January 3rd, 1896.

x-Q. 46. Please to go on and give a detailed account of everything that occurred between Mr. Liddell and you on January 7th, 1896, and please be careful not to imagine or to infer anything, but confine yourself strictly to what you positively remember?

A. The minor details of what occurred are not impressed upon my mind, but I am prepared to say this—that the defect in the mechanism as illustrated in the original drawing was pointed out to Mr. Liddell by me and we discussed how the drawing could be changed, and whether or not anything that I said in that discussion influenced him, I do not know, but whatever changes were made in the drawing to make it conform to what now appears in the patent were made under his positive instructions, for under no circumstances would I have changed the drawing without those instructions. If it was his intention originally to have the plate E rotate it is quite evident that when the case was corrected he was not wedded to that idea, for the changes which I was authorized to make produced an oscillatory motion to the plate.

x-Q. 47. In your consultation with Mr. Liddell on January 7th, 1896, did you go by the first blue print or did you have the original drawing before you?

A. We had both, the blue print was annexed to the paper which he brought back and the original drawing was in my office, so that we had them both before us, but in the first discussion we no doubt used the blue print because it was with the papers he brought in.

x-Q. 48. I observe that the original blue print now has some pencil marks surrounding the shaft *f* and extending about an inch to the right of that shaft under the letter M′ and extending also very faintly about an inch to the left of that shaft, and I also observe that about an inch above the letter M′ there is a pencilled circle about a quarter of an inch in diameter surrounded by circuitous but irregular line about a half an inch in diameter; and I also observe that there is a pencilled line about four inches long extending directly upward from the center of the shaft B, and also a pencilled line about an inch long extending from the last mentioned line diagonally upward through the shaft L. Now, please to state whether those pen-

cilled marks and lines were made upon the first blue print by you on January 7th, 1896, as a memorandum to be followed by you and elaborated by you when changing the original drawing as it was decided to be changed?

A. They were made by me or at least most all of them, as far as I am aware, were made by me on January 7th, 1896, during my discussion with Mr. Liddell, and at that time the thought was to leave the gears K and put a cam as indicated in pencil marks on the eccentric gear K surrounding the shaft *f* and then make that cam oscillate to give an additional movement to the gear M′ in the manner shown in the patent. There was also to be an additional cam to operate upon a short arm from the arm F. The curved line through the shaft L indicates the throw of the free end of the arm which is to be attached to the arm F and operated by a cam which was to be secured to the shaft L. Upon second thought it was decided that it was useless to use the cam gear as the same result could be secured by putting the cam shown in pencil in the first blue print upon the shaft L instead of the shaft *f*, and this was the way it was shown in the corrected drawing as filed in the Patent Office.

x-Q. 49. How long a time did you and Liddell spend together on January 7th, 1896, in considering whether to use or to discard the two eccentric gears K and in considering whether the cam which is shown above the letter M′ should be applied to the shaft *f* or should be applied to the shaft L, and in considering how that cam should be connected with the gear M′ so as to rock that gear somewhat and in considering how the cam which you decided to place upon the shaft L was to be connected through a new arm with the arm F?

A. I do not know, but a very few minutes, as it was a matter of no complication and as he was there the matter could be decided at once. Both he and I considered the particular mechanism employed to produce the particular movements was immaterial to the generic invention which was embodied in the language of the claims as then prepared and which were the claims substantially as they were issued in the patent.

x-Q. 50. It is true, is it not, that you furnished the ideas which were embodied in the changes which he authorized you to make and which you represented fully enough for your own

memorandum in the pencilled lines upon the first blue print which lines are described in x-Q. 48?

A. I do not consider that I furnished the ideas, because in the first place, the main mechanism of the machine was left as he originally had it and the changes which were authorized were the result of his going over the matter with me with a view of obviating the defects which I pointed out to him. So far as I was concerned, it was totally immaterial to me which change he chose to make and no matter what he had determined should be shown, had it been operative, would have been accepted by me and placed upon the drawing at once.

x-Q. 51. It is true, is it not, that you are an alert and rapid thinker in mechanics; while Mr. Liddell is a corpulent old Scotchman whose mental operations are always very slow and whose power to explain mechanism in words is decidedly inferior to your own, to say the least?

A. All that you say may be true, but the changes in the mechanism of the drawing were so trifling that I believe Mr. Liddell was very quick to perceive what those changes should be, and it is quite possible that in discussing the matter with me his mind operated faster than it would had he been by himself.

x-Q. 52. It is true, is it not, that on January 7th, 1896, Mr. Liddell did not seem to care how the case was fixed up or take any real interest one way or another in the changes which were necessary to be made by somebody in the mechanism of the original drawing and of the first blue print; inasmuch as his contract in pursuance of which he was to assign the invention had expired in the previous October and he had no pecuniary interest whatever in the application that was to be made or in any patent to be issued in pursuance of that application?

A. I cannot tell what was in his mind, and while I know that it was difficult to get his attention when we wished him to come over to Philadelphia he at least came on January 7th, and as I recollect it gave all the time that was necessary. If he authorized the changes so as to make the forming plate E oscillate instead of rotate, I do not know whether it was from indifference or because he thought the oscillating feature was the best.

x-Q. 53. You have stated that you occupied but a few minutes with Mr. Liddell on that occasion, in deciding what changes to make in the original drawing. Now, please to state whether you yourself proceeded to make in pencil those changes in the original drawing which put that drawing into the condition shown by the second blue print and then proceeded to personally ink in those changes on the one hand, or whether on the other hand you pencilled in those changes yourself and sent the drawing to Mr. Drury to have them inked in, or if neither of these hypotheses is correct then please to state in detail when and by whom the original drawing was changed from the condition shown by the first blue print to the condition shown by the second blue print?

A. I at once pencilled in on the original drawing the changes which it was decided should be made by Mr. Liddell, and as soon as I put in the few lines necessary to indicate these changes I made the red ink changes in the specification to correspond so that there should be nothing left undecided, as I did not want Mr. Liddell to get away from Philadelphia until everything had been completed. The inking of the drawing, however, was done by Mr. Drury after I got through, but whether it was on the same day or the next day I cannot say.

x-Q. 54. When you made those pencilled changes in the original drawing, did you first erase the gears K therefrom so that you could pencil in the cam K′ and the cam K and the rod *k′* and the link *k*2 and the arm connecting that link with the gear M′, ready for Mr. Drury to ink in those new parts; or did you simply indicate on the drawing in pencil where those new parts were to go and what they were to be like in construction and form, leaving him to erase the two eccentric gears K and then ink in the new parts according to your pencilled sketch thereof?

A. I cannot say whether the actual erasure of the eccentric gears was made in my office or made by Mr. Drury. It frequently happens in drafting when changes are laid out prior to erasure that a pencil tracing is taken off on a piece of tracing linen or paper of the parts to be added so that during the erasure if anything is erased it can be easily redrawn.

x-Q. 55. Have you personally seen that original drawing at any time since it was filed in the Patent Office with all its changes made on February 6th, 1896?

A. No, I have never seen it.

x-Q. 56. Now, I deem it proper to state to you that I have seen that original drawing several times during the last year and examined it with minute particularity, and that it contains no evidence whatever on its face that it ever underwent any change so extensive as the erasure of the eccentric gears K therefrom. But I am convinced that the original drawing was changed by you or by Mr. Drury prior to February 6th, 1896, because you say it was; and also because the written words "William Liddell by R. M. Hunter" are exactly alike on the first blue print and the second blue print; and also because the first blue print and the second blue print are exactly alike in respect of those parts of the original drawing which were not changed. Under these circumstances I ask you whether the fact that the eccentric gears K were erased after having been inked in so carefully and so skillfully that no trace of that erasure remains, together with the fact that the surface from which they were erased was left so smooth after the erasure as to be able to receive the inked drawing of the new part without any roughness of lines do not indicate that the erasing of the eccentric gears K and the insertion of the new parts in their places was done with great deliberation, care and skill?

A. I do not consider that it requires any skill whatever, nor would it require but a very little time to do the work of erasing. It simply required a proper eraser and the necessary degree of patience so as not to unnecessarily abrade the surface of the paper. Another point is that if good paper is used, erasures are very easily made without injury. I know that both Mr. Drury and myself can make erasures without any difficulty whatever, and to the average person the erasure would hardly be observed. As the surface of the paper is not broken, the ink flows readily and clean lines are made.

x-Q. 57. As a matter of fact was it you or was it Mr. Drury who erased the eccentric gears K from the original drawing and inserted in that drawing the new parts which are shown

in figure 1 of the second blue print and which are not shown in figure 1 of the first blue print?

A. That I cannot say, as I do not recollect.

x-Q. 58. Was Mr. Drury in your office on January 7th, 1896?

A. That I cannot say, I do not recollect.

x-Q. 59. It is true, is it not, that the only signature which anybody wrote upon any of the application papers of Case A on January 7th, 1896, were three signatures of William Liddell and the signatures of the two witnesses, R. M. Hunter and Ernest Howard Hunter, and one signature of Ernest H. Hunter, and that all those signatures were written on blanks used in your office, namely, a blank sheet containing a petition to the Commissioner of Patents and another blank sheet beginning with the words

"In testimony of which invention I have hereunto set my hand."

And which latter blank sheet continued still further with a blank oath. And it is true, is it not, that the only pieces of paper to which anybody attached any signature in this case on January 7th, 1896, were those two blank papers neither of which contained any word or mark whatever connecting it with any particular paper bag machine whatever, so that it was possible for you to subsequently get up any kind of a paper bag machine specification you pleased with any kind of drawings you pleased for a paper bag machine and send that specification and those drawings to the Patent Office with the two papers which Mr. Liddell signed, and one of which was signed by Ernest Howard Hunter as Notary Public; and it is true, is it not, that no papers whatever were attached to the two blank sheets which Mr. Liddell signed at any time on January 7th, 1896; and it is true, is it not, that the typewritten sheets of specification which you did send to Washington and to the Patent Office with the blank sheets which Mr. Liddell had signed on January 7th, 1896, were never written at all until after January 7th, 1896, and were never seen by Mr. Liddell in his lifetime until now?

A. Your assumptions as far as I know are entirely wrong. In the first place, the so-called blanks are the same character

of blank which I have used for 30 years in my practice and which are used in numerous other offices, and they are not on two separate sheets, as stated in the question, but are in the form of a folder between which the specification in typewriting is placed and secured by an eyelet or the usual fastening devices. When the case is examined in the Patent Office it is customary for the Examiner to sever the blank at the top because under the rule of the Patent Office the pages are to be connected only at the upper left hand corner. In the next place, the corrections to the original draft of the specification only required a few minutes to make and they were made by me at once on January 7th, and as far as I am aware the specification was at once recopied and placed in the blank containing the petition, the beginning of the specification and the oath. The specification begins on the front page of the blank. As far as I am aware there was no difference in the rule followed in preparing this application and any other and there was no object, and never has been, for making any changes of any character in the case after Mr. Liddell had executed it. Furthermore, the claims of the patent as issued were exactly the claims that were drawn up by me prior to the signing of the application by Mr. Liddell, and no change of any kind was made nor was there any cause to make any change after the execution of the application. I always have a number of typewriters at work and four machines, my operators being very skillful and I have no difficulty in getting out my work promptly when necessary.

Adjourned to Saturday, July 25th, 1903, at 10:15 A. M.

NEW YORK, July 25, 1903.

[*Met pursuant to adjournment.*]

Present: Counsel as before.

RUDOLPH M. HUNTER, *testimony continued:*

[*Cross-examination by* MR. WALKER *continued*]:

X-Q. 60. It is true, is it not, that the only signature which anybody wrote upon any of the application papers of Case 'A'

on January 7th, 1896, were the three signatures of William Liddell as applicant and the one signature of Ernest Howard Hunter as notary and the signatures of the two witnesses R. M. Hunter and Ernest Howard Hunter; and it is also true, is it not, that all those signatures were written on blank printed pages such as are used in your office for applications for patents in general; and it is also true, is it not, that neither of those blank printed pages contained any part of the description or claims of the specification or contained any word or mark connecting the papers to which the signatures were attached with any particular paper bag machine or with any particular drawing or specification?

A. It is not true, but so far as the particular signatures are concerned the papers themselves will establish what signatures were on the application as executed, and it is quite possible that the signatures mentioned are correct.

x-Q. 61. It is true, is it not, that the application papers which you sent to the Patent Office for Case A (and which were filed in the Patent Office February 6th, 1896, as serial number 578,291, and which resulted in the granting of the Liddell patent No. 558,969 of April 28th, 1896), consisted of the following documents: 1, a petition and power of attorney; 2, a specification including a description and eight claims; 3, an attestation clause below the eighth claim reading as follows: "In testimony of which inventon, I have hereunto set my hand"; 4, an oath. And it is true, is it not, that that petition and the first paragraph of that specification (namely, "To all whom it may concern: Be it known that I, William Liddell of the City of Brooklyn, County of Kings, State of New York, have invented an Improvement in Paper Bag Machine of which the following is the specification), comprised the first page of a printed blank in general use in your office. And it is true, is it not, that the said attestation clause and the said oath comprised the second page of the same printed blank? And it is true, is it not, that those two pages were printed on the first page and the third page of a sheet of paper twice as long as legal cap but folded transversely midway of its length so as to produce a "folder" between the two leaves of which all of the specification after the first paragraph

thereof down to the end of the last claim was to be placed so as to make up a complete set of application papers having the four documents specified in this question?

A. As I understand your question, what you state is true.

x-Q. 62. It is true, is it not, that on January 7th, 1896, William Liddell wrote his signature on the first page of the printed folder below the petition and power of attorney, and also wrote his signature on the second page of the printed folder below the attestation clause, and also wrote his signature on the second page of the printed folder below the oath, and did not at any time write his signature or write anything with his hand anywhere else on any of the application papers which were filed as No. 578,291 February 2nd, 1896, and which resulted in the granting of the Liddell patent No. 558,969 of April 26, 1896?

[*Complainant's counsel objects to above and also to this entire line of examination in questioning the witness in regard to what appears in the original papers on file in the Patent Office as incompetent and not the best evidence, except so far as it may be competent as asking for the recollection of the witness in respect to what did occur with reference to the signing and execution of these papers referred to.*]

[*Mr. Walker states to the Court that he claims this question to be admissible because the original papers on file in the Patent Office are required by law to remain there and cannot be procured to be put in evidence in this case; and because the question relates to points of fact relevant to the physical composition of the different sheets of paper which make up the original application papers, and which points of fact are not regularly disclosed by a certified copy of the original papers and are not disclosed by the particular certified copy which the Patent Office has furnished to the defendant's counsel. For these reasons defendant's counsel claims that secondary evidence is admissible to prove on what sheets of paper the different parts of the original application papers are printed or written, as the case may be.*]

A. That is true to the best of my recollection.

x-Q. 63. Now, when William Liddell wrote his signature at the three places mentioned in x-Q. 62 upon the printed folder, it is true, is it not, that that printed folder contained no description or claim of any paper bag machine and said nothing about paper bag machines except to use the phrase "Improvement in Paper Bag Machines" in the petition and also in the first paragraph of the specification, and also in the oath?

A. That is not true. In the first place, the folder contained the entire specification and claims, and secondly, I notice that you very carefully avoided in your quotation of the matter from the first page of the folder to quote the words "of which the following is a specification" occurring after the words "Improvement in Paper Bag Machines." And I would also point out further that the attestation clause on the last page of the folder reference is made to the invention which precedes it by the language "In testimony of which invention." Furthermore, the front page of the application should contain the words "Case A," and I have no doubt it will be found upon the application in its proper place.

x-Q. 64. Suppose the printed folder (upon which Mr. Liddell wrote his signature in three places on January 7th, 1896, with words Case A written on the first page of that printed folder) were now to be separated from the typewritten sheets which you placed between them, would that printed folder contain any description or any claim or any portion of any description or of any claim of any particular paper bag machine, or anything to indicate what paper bag machine application it referred to; except as the words "Case A" might operate in the latter direction?

A. Under the assumptions of the question which has specifically removed the general description and claims from the application, I can only say no.

x-Q. 65. How long did Mr. Liddell remain in your office on January 7th, 1896?

A. I could not say, but at all events it was long enough to prepare everything properly as I had no intention, after all the trouble that I had had to take, of allowing him to get away without properly executing everything. This was especially so

as Ide, Haverstick & Company had no contract with him at that time, and I felt that we would likely have difficulty in securing his attention or attendance again. I had no occasion to make any memoranda of the exact time he was at the office, or whether he went out and came back again, but I do know that the application as filed containing every word was done while he was there in Philadelphia on that visit and he came over for that especial purpose and no other.

x-Q. 66. I feel very sure, Mr. Hunter, from the evidence which has been laid before me that you are in error in thinking that the sheets of paper which contained the description and claims of Case A when you sent the application papers in that case to the Patent Office were in existence at all when Mr. Liddell wrote his signature on the three places on the printed folder between which those sheets of paper were placed when you sent the application papers to the Patent Office; I therefore find it to be my duty to my client to cross-examine you at some length for the purpose of ascertaining all the surrounding circumstances which may corroborate or may contradict your statement to that effect. I therefore ask you to answer my questions one after the other responsively and directly and without argument, for argument, as you know, is not a function of a witness. What was the color of the ink which was used in writing or typewriting, as the case may be those sheets of paper which contained the description and the claims of Case A when you sent the application papers in that case to the Patent Office on or about January 27th, 1896?

A. That I could not say positively, as there are four typewriting machines in my office and my stenographers purchase the typewriter ribbons which they think are necessary for the office use. I, however, would not be surprised if the specifications were in purple, but as we had some difficulty with the Patent Office regarding the use of permanent typewriter ribbons it is quite possible that some other color ribbon might have been used. The papers in Washington, however, will determine that fact.

x-Q. 67. Please to look at the typewritten document of pages 2 to 12 inclusive, which is bound next after the Patent Office letter of January 29th, 1896, in Complainant's Exhibit

Hunter File Case A, and state whether those 11 pages of typewriting were printed from a ribbon in a writing machine or whether they are carbon copies of an original which was itself, presumably, printed from a ribbon?

A. They are carbon copies.

x-Q. 68. State whether those 11 sheets were printed in a writing machine at the same time with the typewritten sheets of description and claims which you placed between the two leaves of the printed folder of Case A and sent to the Patent Office with that printed folder as the application papers in that case?

A. They are, as far as I know. A comparison will settle that point.

x-Q. 69. It is true, is it not, that at this moment you don't know whether those 11 carbon sheets agree with the description and claims which you sent to the Patent Office in Case A or do not agree?

A. On that point I feel as certain as that I am sitting here, but as all these matters occurred more than seven years ago and as I have had no occasion to make any comparison at any time between my office files and the official files at Washington, I can only say to the best of my knowledge and belief that they are as identical with the originals as carbon copies can be. I cannot say more without making a comparison.

x-Q. 70. Anybody can ascertain the point by making a comparison, but I am entitled to know whether you can give information on that subject without making a comparison, because your ability or inability to give that information will throw light upon the question as to when the description and claims that went to Washington were typewritten upon the sheets of paper which you sent to Washington between the leaves of the printed folder in Case A. Please, therefore, to state whether the 11 carbon pages which you produced day before yesterday as part of Complainant's Exhibit Hunter File Case A, are identical or are not identical in words and references with the typewritten descriptions and claims which you sent to Washington in Case A?

A. Your question is unreasonable in that you ask me to testify to a question of fact which is dependent wholly upon a

direct comparison of two things, one of which is not here present. But to prevent any misunderstanding as to what I meant by my last answer I will repeat that there should be absolutely no difference between the copy in my files and in the original at Washington except so far as one is a carbon copy of the original. The papers were placed in my files in the ordinary course of business and I have not the slightest reason to suppose that there was any difference in the practice in connection with this application than that carried on with all the other cases. To the best of my knowledge and belief, and I say this as positively as any one can say it, the carbon copy in my files is the carbon copy made when printing the original on the typewriter.

x-Q. 71. Statements made "To the best of knowledge and belief" are very unconvincing because knowledge may be slight or absent and belief may be interested and credulous. I therefore ask you to state whether the carbon sheets in question in Complainant's Exhibit Hunter File Case A were made in the same writing machine at the same time with the description and claims which you placed between the two leaves of the printed folder in the Liddell Case A and sent to Washington as the application papers in that case, or whether on the other hand, the sheets which you sent to Washington were typewritten at another time on another writing machine and represent still another revision of this description and claims made by you after you made the revision which is represented by the 11 carbon sheets which immediately follow the Patent Office Letter of January 28th, 1896, in Complainant's Exhibit Hunter File Case A?

A. I have already answered this question twice, but in view of the fact that it is put in another form I will answer it specifically by stating that there never was any further revision after the preparation of the case as shown in my files, and consequently I know of no third writing of the specification on the typewriter. The carbon copy in my files is the carbon copy of the original that went to Washington. While I did not do the typewriting myself I still feel able to very positively make the above statements.

x-Q. 72. Please to look at the two sheets which were written with a pen with red ink and which are bound up with other

papers in Complainant's Exhibit Hunter File Case A and state who did that red ink writing, not including the black ink writing on the same sheet?

A. That is my writing.

x-Q. 73. Who did the black ink writing on the same sheet?

A. I did.

x-Q. 74. Who did the red ink writing on the purple typewritten sheets in the same file?

A. I did.

x-Q. 75. Who was present when you did that red writing on the two sheets of pen writing and when you did the red writing on the purple typewritten sheets?

A. It was done in my office everyone usually present, and it was done when fixing the case with Liddell, as it embodied the corrections which I made in the case under Liddell's instructions.

x-Q. 76. Did Mr. Liddell remain there while you were doing that red ink writing; or did you do that red ink writing after the few minutes which you say in reply to x-Q. 49 were all that you spent with Liddell in considering how to change the original drawing?

A. Liddell unquestionably remained with me until the changes had been made and I have no reason to believe that he did not stay there when the corrections in red were being made as they were made to accord with his wishes. It is quite possible that he may have gone out and came back, but it is too far back for me to remember on this point, as I have given no consideration to the subject from the time the application was prepared up to the time here now when I was requested to produce my files and testify regarding the filing of the application.

x-Q. 77. You have testified that when Mr. Liddell came to your office on January 7th, 1896, you spent but a very few minutes with him in considering whether to use or to discard the two eccentric gears K which Mr. Drury had inked in in the original drawing and in considering whether the cam which is shown above the letter M′ in pencil on the first blue print should be applied to the shaft *f* or should be applied to the shaft L, and in considering how that cam should be connected with the gear M′ so as to rock that gear somewhat and in considering

how the cam which you decided to place upon the shaft L was to be connected through a new arm with the arm F. And you have also testified that after these points were decided you proceeded to change the original drawing in pencil by delineating the new parts thereon so that Mr. Drury could erase the old parts and ink in the new parts; and that you also proceeded to revise the description and claims by means of the red ink amendments which appear upon the purple typewritten first draft of the specification, and by inserting the longer amendments which appear in red ink writing upon the two red ink written sheets in Complainant's Exhibit Hunter File Case A. Now, please to state whether William Liddell was present or was absent when you did that work of changing the original drawing and amending the first specification, or if you don't know whether he was present or absent, please to say that you don't know.

A. This is the same question as the last, and I can only say that Mr. Liddell came to my office for the very purpose of making these changes and I have no reason to believe that he was not present, not only during the time the changes were decided upon as to the drawing, but also when I made the pen and ink changes; that as I before stated after all matters had been decided upon there is a possibility that Mr. Liddell might have gone out and come back, but on this point I cannot say.

x-Q. 78. Have you any recollection whatever that William Liddell was present when you changed the drawings and changed the specificaeion in the way stated in the last question; and please do not evade this question by making statements on collateral matters or by any form of argument, but simply state whether you have any recollection that Mr. Liddell was present with you when you were changing the original drawing and when you were changing the first draft of the specification?

A. Yes, I have, and a very strong recollection.

x-Q. 79. Why then have you evaded the question repeatedly instead of answering it the first time it was put to you?

[Complainant's counsel objects the statements of the above question as without foundation in facts or in the evidence.]

A. I have not evaded or attempted to evade any question but

one minute a question is put strictly limited to a question of fact and the next minute substantially the same question wants an opinion. I have endeavored to answer the questions as put. I have stated therefore that I have a very strong recollection of the presence of Liddell; and that his presence should have been there because it was I who sent after him for the very purpose of making these corrections in the drawing and specification, confirms me in my recollection that he was present. To prevent a misunderstanding with regard to my testimony in this case, and especially in view of the statements and insinuations made by counsel for the defendant, I wish to state that I know nothing about this controversy and am not interested directly or indirectly in it in any sense and have no interest in the outcome, but am here to testify simply because the complainants have requested me to produce the original files of my office and state the circumstances connected with the filing of the applications, more particularly with respect to Case A. I have therefore no interest whatever in making any assumption or placing upon record any statements which are not correct even to the smallest degree.

x-Q. 80. There is no doubt that William Liddell was in your office at least a few minutes on January 7th, 1896, and that in that office on that day he signed his name at three places on the printed folder which you have testified was used to enclose the typewritten sheets of description and claims for the Liddell Case A. And there is also no doubt that that description and those claims were first composed by you in the form shown in purple typewriting in Complainant's Exhibit Hunter File Case A and was subsequently amended by you prior to January 7th, 1896, as shown in pencil on those purple typewritten pages, and were also at some time on or after January 7th, 1896 ,still more extensively amended by you as shown in red ink on those purple typewritten pages and as shown on the red ink written sheets in Complainant's Exhibit Hunter File Case A. You have also testified that all those red ink changes were made by you in your office on January 7th, 1896, and that on the same day you changed in pencil the original drawing which Mr. Drury had previously made in ink. Now let us pass on from those points

and place in the record your testimony upon another point which is not there yet, in my judgment, and which, if you are so disinterested as you claim to be, you can have no objection to putting in the record now, whether it is in the record already or not. Please therefore to state whether William Liddell was present with you when you made those red ink changes in the description and claims and when you made those pencil changes in the original drawing, or whether he was absent when you were doing that work or whether you don't remember now whether he was present or was absent when you were doing that work?

A. I have already answered this question several times, and will again say that I have a very strong recollection that he was present when I made those changes referred to, and this recollection is confirmed by the fact that he came to my office to see me expressly upon this subject and for the purpose of making those changes and executing the application when properly corrected, and for no other purpose. He came from Brooklyn for this purpose, and I am convinced from my recollections of the matter that he was present when the changes were made.

x-Q. 81. How is that conviction consistent with the statement heretofore made by you that Mr. Liddell might have gone out while the changes were being made and come back afterward?

A. There is no inconsistency whatever if you read my answers correctly. I stated that I had a strong recollection that he was present, but I also stated that these events took place so many years back that there was a possibility of Mr. Liddell's going out of the office and coming back later in the day after the changes in the drawings had been decided upon, and during a part of the time at least when corrections in the specification were being made, but I do not say that he did go out. My recollection is that these changes were made when he was there, and that is all that I can say about it.

x-Q. 82. Mr. Hunter, is not that recollection of yours based rather upon how you would now wish the fact to be, rather than upon any definite knowledge that William Liddell was in the room while you were making those numerous and complicated changes (for it is already proved by the documents and blue

prints which you have produced that they were numerous and complicated)?

A. I have no care personally with regard to the particular facts inquired of, and hence the insinuation in the question is entirely out of place. The statement in the question regarding the numerous and complicated corrections is also uncalled for and incorrect for while the corrections may be complicated to an ignorant man they are exceedingly simple to any one having a proper technical knowledge.

x-Q. 83. Please state whether William Liddell was in your room or was not in your room when you changed the original drawing from the condition of the first blue print to the condition of the second blue print and when you made the 22 red ink changes which appear upon the face of the purple first draft and when you composed the three paragraphs of new matter which appear upon the red typewritten sheets in Complainant's Exhibit Hunter File Case A? Or if you don't know whether William Liddell was present or was absent in your room when you were doing all that work then please to admit that you don't know whether he was in the room or out of the room at that time?

A. This is another repetition of the same old question and I will again say that he most certainly was in my room and was there during the making of those changes, to the best of my recollection.

x-Q. 84. Is that recollection reliable enough to justify you in swearing to it as a fact in this case, in which you say you have no personal interest, on the assumption that the issue of the case will depend upon the reliability of that recollection?

A. I do not know what the issue of the case is, and am not concerned in it, and no matter what the issue is or the relation of my testimony to it I am prepared to say that my recollection of the presence of Mr. Liddell in my office during the making of those corrections is strong enough and reliable enough to "justify me in swearing to it as a fact in this case."

x-Q. 85. How long did you occupy in making all those changes in the description and specification and in making those changes on the original drawing?

A. The whole thing did not consume more than half an hour or about that time.

x-Q. 86. Do you remember any particular thing that you said to Liddell or that Liddell said to you after the changes had been agreed upon and while you were engaged in actually writing the red ink amendments and making the pencilled changes on the original drawing, and if you do remember any such statement, please to tell what it was and who it was that made the statement during the time you were doing that red ink writing or during the time you were making those pencilled changes on the original drawing?

A. I do not recollect any such conversation as the question implies.

x-Q. 87. Now, Mr. Hunter, please state whether Mr. Haverstick was present or was absent in the room when you made those red ink changes in the specification and claims and made those pencilled changes in the original drawing, or if you don't remember whether he was present or absent please to say so at once and thus avoid a long cross-examination on that simple question?

A. He was not present, as I recollect it, though he might have been in one of the other rooms, for instance, my brother's, but he was not in my room.

x-Q. 88. Was any other person whatever in your room on January 7th, 1896, at any time when William Liddell was there on that date?

A. Not that I recall, except it was a clerk who might occasionally come in.

x-Q. 89. If any person was present with Liddell and you in that room on that day, was that person consulted by you or by him relevant to either or both of his paper bag machine cases A and B?

A. No.

x-Q. 90. Was any change made on January 7th, 1896, in the description, claims or drawings of the Liddell application Case B which ultimately resulted in the Liddell patent 564,288 of July 21st, 1896?

A. No, no changes were made in that application, as it was ready for filing.

x-Q. 91. In your letter of January 3rd, 1896, to Mr. Haverstick you stated that you enclosed the application of Case A therein and that the papers are sent in rough so that Mr. Liddell can execute the application with a view to having the necessary corrections made afterward in recopying, or words to that effect. Now, please to state whether those papers which you sent to Mr. Haverstick on January 3rd, 1896, included the printed folder which you subsequently used in that case, and included also the original draft of the specification with the pencil amendments and without the red ink amendments?

A. I presume it did, and it also contained the memorandum calling attention to the defective parts upon which it was necessary to have more information.

x-Q. 92. Was it your plan and expectation when sending those papers to Mr. Haverstick that Mr. Liddell would make the necessary corrections in the specification and then sign his name at the proper places on the printed folder and then send the corrected specification and the signed folder back to you, whereupon you would make a clean copy of the specification as corrected by Mr. Liddell and insert that clean copy in the folder in the place of the amended draft and send the folder with the clean copy of the amended draft to the Patent Office as the application papers in Case A?

A. The point I had in mind was this: As the contract with Liddell had run out Mr. Haverstick had considerable difficulty in getting him to do those things which still remained to do under the former contract, and on account of the trouble that I had had in connection with the case I wished that when Mr. Haverstick went over to Brooklyn with the case that he should have Mr. Liddell fix it up regarding the changes, and swear to it, so that we would have a proper possibility of securing the invention for Mr. Haverstick. I have had frequent occasion in this matter to file roughly drawn applications in the Patent Office, and afterwards elaborate them in recopying, and it may have been that thought that was in my mind at the time as I wished to lose no opportunity to secure the signature of Mr. Liddell to the application. I however also knew that there was another application which he would have to sign, and it may have been in my mind that we would get his signature to the

rough draft and then re-draw or re-copy the specification and let him swear to the new draft when executing the second case. I cannot recall at this time which of these two ideas were in my mind, but I was very anxious to have him tied down by the actual signing of an application for this particular invention, as that was the wish of Messrs. Ide, Haverstick & Company especially in view of the seeming indifference of Mr. Liddell to his obligation.

x-Q. 93. You say in your last answer that you have had frequent occasion to file roughly drawn applications in the Patent Office and afterwards elaborate them in recopying. Am I right in understanding that when writing the letter of January 3rd, 1896, to Mr. Haverstick you were providing for another such occasion, and were intending to file in the Patent Office the original draft of the specification as it might come back from Mr. Liddell with whatever changes he might have made in it; with a view to subsequently make a clean copy of the specification as thus amended with more or less elaboration and subsequent correction, and with a view to file that clean copy in the Patent Office as an amendment to the original specification by virtue of the authority conferred upon you in the power of attorney on the first page of the folder "to make alterations and amendments" in the application?

A. I had no intention of filing the application in a roughly drawn form unless circumstances compelled it, but I did wish to secure the signature to a specification on this paper bag machine including the corrections as drawn, so that it could be used if necessary in that form. I knew that it would be necessary to again see or reach Mr. Liddell and I could see no reason why, if no difficulty arose, I could not secure a second execution of the application after a clean copy of it had been made. However, the rough draft was not filed because the second occasion occurred in which I was able to see and talk to Mr. Liddell and secure his signature to the clean application.

x-Q. 94. We will make more progress if you will confine your answers to the questions put, and will refrain from observations outside of those questions. My last question was confined to

the intention you had on January 3rd, 1896, and did not include any other inquiry whatever. Now your letter of January 3rd, 1896, contains the following sentence: "The papers are sent in rough so that Mr. Liddell can execute the application and we can add the corrections in recopying." Now state whether you intended at that time to make a clean copy of the first draft of the specification as corrected, or not corrected by Mr. Liddell and send that copy to the Patent Office in place of the rough papers which you were sending to Mr. Haverstick with a view to their execution by Mr. Liddell?

A. I cannot make this any clearer than I have in my answers to questions 92 and 93. When sending the rough draft to Mr. Haverstick, it was quite evident that some corrections would have to be made and I expected Mr. Liddell to make those corrections when executing the case. I also knew that sooner or later before the patent could issue that the rough draft of the specification would have to be copied word for word but in clean form and I no doubt used the language quoted in my letter to signify to Mr. Haverstick that he should at least get Mr. Liddell to execute the application even in its rough form.

x-Q. 95. In the course of your long experience as a patent solicitor you have frequently had a man sign his name at the proper places on one of your folders while the description and claims of his application were still rough and uncopied, so as to complete the execution of the application without any delay and have afterward had a clean copy made of the specification and claims and inserted that clean copy in the folder in place of that rough copy and sent the whole to the Patent Office as the application papers in the case; have you not?

[*Objected to as immaterial.*]

A. You have no cause for any such supposition, and I can recall no case where that was done.

x-Q. 96. In the course of your long experience as a patent solicitor you have frequently had a man sign his name at the proper places in one of your folders while the description and claims of his application were still rough and uncopied, so as to com-

plete the execution of the application without any delay, and have filed that roughly drawn application in the Patent Office and have afterwards elaborated the specification and made a clean copy of the whole and have sent that clean copy to the Patent Office as an amendment to the original rough specification, have you not?

A. I do not recall any application that was filed in that particular manner in which you have outlined.

x-Q. 97. You have been criticised very severely by officials in the Patent Office in a number of different cases from time to time during the last twenty years for methods of practice thought by the Patent Office to be irregular and fraudulent, have you not?

A. I have not, and any man that says so cannot base it upon any truth.

x-Q. 98. Have you never read any decision of any examiner or commissioner of the Patent Office in any case in which you were a party and in which decision you were severely criticised for irregular or fraudulent practice or for fictitious testimony given by you?

A. No, I have not, I have read decisions where my opponent chose to make assertions which naturally came up under discussion, but they only made them from ignorance and because of their fear of defeat.

x-Q. 99. Has not one or more interferences in which you were the applicant as well as the person conducting the interference been decided against you in the Patent Office on the express ground that your own testimony was not believed by the Patent Office?

A. Never. Not in a single instance. When I lost an interference it was invariably on the ground that my invention was made so long before my application and my application was made after the application or reduction to practice of my opponent that I was held not to have shown the requisite diligence. I won a great many interferences notwithstanding all the opposition that was centered against me.

x-Q. 100. Is there no decision printed in the Official Gazette of the Patent Office or in the

Volume of Commissioners' Decisions wherein any statement is made by the Patent Office official rendering the decision, and which statement reflects unfavorably upon your character in point of honesty or truthfulness?

A. None that I recall.

x-Q. 101. Do you know what your own reputation is for truth and veracity among patent lawyers and patent solicitors who know that reputation?

A. Every solicitor and every attorney with whom I have had any contact amounting to anything, hold my reputation very highly, and once when I was attacked by my opponent with an endeavor to show that I had wrongfully obtained the allowance of a claim in the Patent Office which should have gone to them and which was due wholly to the carelessness of the Patent Office and not due to any fault of mine, I took occasion at that time to file in the Patent Office letters from all over the country from responsible attorneys and solicitors indicating the high reputation I had with them and to refute the contemptible and unfounded charges of my opponents who were their own attorneys, and my position was sustained. No patent attorney or lawyer with whom I have any acquaintance sufficient to give him a proper knowledge of my character holds to my knowledge any opinion but a good one of me. I am aware, however, that my work in the scientific field has stood so strongly in the path of other inventors and corporations that some unscrupulous attorneys have taken occasion behind my back to make false statements of all kinds. In some of these cases that came to my knowledge I requested them to put the statements in writing and I would prosecute them for libel, which they declined. No man can be successful in the world without making enemies at some times, and the fact that I may have enemies, most of them practical strangers to me, I must accept as inevitable under the circumstances.

x-Q. 102. It is true, is it not, that you and I never had any relations, either on opposite sides or on the same side of any interference, litigation in court or other controversy prior to when you began giving this deposition day before yesterday?

A. That is true in the main, but I have given attention to

matters for Mr. John R. Bennett which I understood from him came through you.

x-Q. 103. I know of no such relations through Mr. Bennett, and therefore I ask you to mention the case to which you refer?

A. I have frequently seen you in Mr. Bennett's office some years ago, and if I mistake not, one of the cases involved a button fastener construction, but I have had no personal dealings with you at all, or at any time that I know of.

x-Q. 104. You are in error in your testimony on this subject, for I never saw you in Mr. Bennett's office, and I never had any connection with Mr. Bennett relevant to any button fastener, and I never saw you but twice in my life before you went on the stand in this case day before yesterday, the first time being in 1898 in the Philadelphia Electrical Exposition of that year where you had an electric exhibit which you showed to me, and the second time being in my office in Manhattan, New York, in March, 1903, when you called there at the time Mr. Liddell began his deposition in this case. I mention these points to show you that I have no motive to entertain any personal grudge against you, and am putting my inquiries on this line as a matter of professional duty without any personal malice or other objectionable motive. Are you acquainted with Frankland Jannus, a patent lawyer and solicitor of patents?

A. I am, and he represented some of the most adverse interests.

x-Q. 105. Has Frankland Jannus had a good deal of contact with you in professional work, upon which you were both engaged in interferences or other litigations?

[*Objected to as going entirely outside the scope of legitimate cross-examination.*]

A. There was no social acquaintance whatever, but he was the attorney of Van Depoele, who was my opponent in a number of interferences and in those connections I frequently had occasion to see Mr. Jannus.

x-Q. 106. You have had in the past a good deal of bitter controversy with the General Electric Company in cases in which that company was represented by Betts, Betts, Sheffield & Betts, have you not?

A. I do not understand your question, as the General Electric Company own many of my electrical inventions and had a right to do with them as they thought fit and without regard to any consideration on my part. I do not recall any so-called controversy.

x-Q. 107. After you had made the red ink changes and additions to the Liddell Case A on January 7th, 1896, and had made the pencilled changes on the original drawing; what was the next thing you did in that case?

A. The only thing to be done was to have the specification copied and executed, and that was done. Of course the drawing where changed had to be inked, as I have before explained.

x-Q. 108. It is true, is it not, that the drawings were not changed in India ink until after Mr. Liddell wrote his signature at the three places upon the printed folder?

A. I presume that that is right, because though I laid out the pencilled changes on the drawing and in all probability sent the drawing at once to the draughtsman to ink them, he would have hardly have thought it necessary to ink them at the moment, but I do not even know that he did not, so that I cannot answer the question with absolute certainty on this question.

x-Q. 109. It is true, is it not, that you sent the original drawing with the pencilled corrections indicated thereon two blocks and a half away to the office of Mr. Drury and that the work done on that drawing to erase the eccentric gears K and to ink in the new parts was done by Mr. Drury in his own office, and returned to you in the regular course of business?

A. There is no question but that these corrections were inked in Mr. Drury's office as you mention.

x-Q. 110. It is very improbable, is it not, that you kept Mr. Liddell waiting in your office after you had made the red ink changes in the draft of the specification, until the drawing should be sent to Mr. Drury at his office and the necessary erasures and additions made thereto and then be sent back to your office, before allowing Mr. Liddell to write his signature on the proper places on the folder and make the oath and go away?

A. I do not know that it is improbable, but I do not see that

it was at all necessary for having laid out the changes in pencil and having them clearly defined I do not consider that the mere inking of those changes was sufficient to hold up the execution of the application.

x-Q. 111. I am not asking you what was necessary to be done or what was proper to be done, and I must ask you to discontinue your practice of acting as the Judge in this case to pass upon the materiality of my questions. Your whole duty consists in saying what was done and what was not done, and it is grossly impertinent for you to assume to judge of the materiality of my questions. Please therefore to state whether you did keep Mr. Liddell waiting while the drawing was sent to Mr. Drury's office and while Mr. Drury was erasing the gears K and was inserting the cams K and K1 and the rod *k1* and the link *k2* and the arm connecting that link with the gear M1, in that drawing, and until the drawing was returned by Mr. Drury from his office to your office; or whether on the other hand, Mr. Liddell wrote his signature on the three places in the printed folder and took the oath on that folder and went away before the drawing came back from Mr. Drury's office?

A. Your previous question was very different from your present question, and in asking for the "probability" it was asking for an expression of opinion and I answered it properly notwithstanding your criticism.

Your present question asks for a positive statement of fact and eliminates the idea of probability or possibility, and I can only say in answer to it that I do not know and I cannot answer any more fully than in my previous answer.

x-Q. 112. After you had made the red ink changes and additions to the Liddell Case A on January 7th, 1896, did you keep Mr. Liddell waiting while the 11 pages of typewritten specification and claims (which you sent to Washington with the printed folder which Mr. Liddell signed) were being typewritten from the various sheets of typewriting and ink writing from which those 11 pages were copied, on the one hand, or on the other hand did you simply treat those various sheets of typewriting and ink writing as the then-existing specification of the case and have Mr. Liddell sign the printed folder and take the oath upon the printed folder in connection with those various sheets of rough draft and amendment?

A. I do not know or recall at this time whether Mr. Liddell stayed in the office the whole time that the specification was being copied or whether he went out and came back during the copying or part of it to execute the application, but the application was recopied and everything that was necessary was done while Mr. Liddell was in Philadelphia. I have no reason to believe that any deviation from the regular course was carried on in this case, and especially not when I had made every effort to secure the attendance of Mr. Liddell for this very purpose.

x-Q. 113. Your answer is entirely unresponsive because it does not state whether the copy that went to the Patent Office was made before or was made after Mr. Liddell wrote his signature at three places upon the printed folder and took the oath which was on the printed folder. Now, Mr. Hunter, I require you to state whether that final copy which went to the Patent Office was made before Mr. Liddell took that oath or was made after Mr. Liddell took that oath, or if you don't know then say that you don't know, but I demand that you shall not evade that question again.

A. My previous answer, I think, fully answers the question because I stated that the copying was done while Mr. Liddell was there in Philadelphia and while I could not say whether he went out and came back during the copying, I did say "the application was recopied and everything that was necessary was done while Mr. Liddell was in Philadelphia." If that is not clear enough I will simply add as answer to the present question that my recollection is that the application was recopied and everything was in proper order on January 7th, 1896, when Mr. Liddell signed and executed the application.

x-Q. 114. Are you going to answer x-Q. 113 or not?

A. I have fully answered the question and I do not see how I can make it any more plain, for the specification which was copied before the signing was the specification which went to Washington.

x-Q. 115. You have not said prior to x-Q. 114 anything, even tending to commit you on the question whether the final copy which went to the Patent Office was made before Mr. Liddell took the oath or was made after Mr. Liddell took the oath; and your answer to x-Q. 114 seems to me to be too ambiguous to be

made the foundation for an indictment for perjury, no matter what the truth may have been. Now Mr. Hunter, I want you to tell now, without any further evasion whether the 11 pages of typewritten description and claims which you sent to Washington on or about January 27th, 1896, as the specification of the Liddell Case A were made before or were made after Mr. Liddell signed the folder and made the oath on the folder on January 7th, 1896.

A. Your language is open to criticism because it is totally uncalled for, but at the same time your inability to understand my previous answers which seem to me very plain, might be justification from your standpoint, to desire further statement from me. I have stated, and I now state again, that my recollection is that the papers were copied, that is, the pages you refer to, and were annexed to the blank after it had been filled out, and that when this was done Mr. Liddell executed the application by signing and swearing to it and this application was subsequently sent to Washington.

[*Mr. Walker requests complainant's counsel and the witness to refrain from all conversation relevant to this case between each other at any time before the deposition of this witness is closed, corrected and signed; and Mr. Walker requests the witness to review his own motives and conduct and to be prepared next week to answer the questions that are put to him without delay, evasion or subterfuge; and Mr. Walker notifies the witness that next week the first question will be a substantial repetition of x-Q. 115, and that that question will be repeated hour after hour and day after day for a considerable time if necessary unless it is sooner answered without evasion or subterfuge.*]

[*Complainant's counsel takes the liberty of stating that if any such performance is attempted on the part of defendant's counsel, proper proceedings will be promptly taken to suppress anything which is not legitimate cross-examination and does not conform to proper practice.*]

[*Adjourned to Monday, July 27, 1903, at 11 A. M.*]

NEW YORK, July 27, 1903.

[*Met pursuant to adjournment.*]

Present: Counsel as before.

RUDOLPH M. HUNTER, *resumes.*

[*Cross-examination continued by* MR. WALKER]:

x-Q. 116. Were the eleven pages of typewritten description and claims which you sent to Washington on or about January 27th, 1896, as the specification of the Liddell Case A, typewritten before Mr. Liddell signed the folder and made the oath on the folder on January 7th, 1896?

A. According to my recollection, they were.

x-Q. 117. Do you have any definite recollection upon that point, or is your last statement based merely upon your present impression as to what the fact probably was?

A. The case was rather an unusual one, and had given me considerable trouble to get it in shape so that it could be filed in correct form, and the fact that I was compelled to bring Mr. Liddell to Philadelphia for the sole purpose of getting this case into shape and getting it properly executed, makes the matter more prominent in my mind that ordinary applications, where no unusual difficulties arose. For this reason, my recollections in connection with what took place in the preparation and execution of this application are more than impressions.

x-Q. 118. You have already contradicted yourself in the present deposition, and many of the statements made in the present deposition are ambiguous, so that my last question did not extend to your recollections in general but only to the precise point specified in x-Q. 116. Please to confine your answer to that precise point, and state whether you have any definite recollection whether the eleven pages of typewritten description and claims which you sent to Washington on or about January 27th, 1896, as the specification of the Liddell Case A, were typewritten before, or were typewritten after Mr. Liddell signed the folder and made the oath on the folder on January 7th, 1896?

[*Objected to as already frequently answered.*]

A. Your statement that I have contradicted myself is unnecessary and uncalled for. The record shows for itself. I endeavored to answer your question and did answer it very fully. I stated and I now state that the pages were written before execution of the application, and that my recollection of this was more than an impression, for the reason stated in my previous answer.

[*This answer is objected to as ambiguous because "the pages" referred to therein may be thought to mean the original draft of the specification as amended in red ink, or may be thought to mean the eleven pages of typewritten description and claims which were sent to Washington on or about January 27th, 1896, and because x-Q. 118 was confined to an inquiry as to those precise eleven pages of typewritten description and claims, and did not include any inquiry into the date of origi of the words typewritten on those pages.*]

x-Q. 119. Please to confine your answer to this question to the identical eleven sheets of typewritten description and claims which you sent to Washington on or about January 27th, 1896, as the specification of the Liddell Case A, and state whether those identical eleven sheets were typewritten before or were typewritten after Mr. Liddell signed the folder and made the oath on the folder on January 7th, 1896?

A. I have already testified a number of times that they were. I can only repeat that now.

x-Q. 120. You have never before testified that those eleven sheets were typewritten before Mr. Liddell signed the folder and made the oath on the folder, and it is absurd for you to say that you have so testified. The nearest you ever came to testifying to that effect was this morning, where you said, "According to my recollection they were." In my judgment that answer amounted to nothing whatever, because your recollection may amount to nothing whatever. Now, Mr. Hunter, I want you to testify under oath what the truth was on that precise point, and to testify so clearly that you can be indicted and convicted for perjury if your testimony turns out to be false. Now, please to state the truth in respect to the following question: Were the eleven pages

72 of typewritten description and claims which you sent to Washington on or about January 27th, 1896 (as the specification of the Liddell Case A), typewritten before Mr. Liddell signed the folder and made the oath on the folder on January 7th, 1896?

A. I have already answered this question and I can add nothing more to what I have already said. That my answer does not please you is quite evident from your insults, but there is nothing I can add that will change the plain fact that these pages referred to by you were typewritten and made part of the application with the folder before Mr. Liddell signed them and swore to them.

x-Q. 121. But you have already testified that Mr. Liddell never signed the eleven sheets; but that he only signed the fold-
73 er between which you sent the eleven pages to the Patent Office on or about January 27th, 1896. Now, Mr. Hunter, the question is whether those eleven pages were typewritten before Mr. Liddell signed and swore to the folder on the one hand, or whether, on the other hand, they were typewritten at some later time during the twenty days which passed before you sent them with the folder to the Patent Office. Now, I am not inquiring of you whether you have heretofore answered that question, because it is not your function to construe your answers, but I have a right to ask you, and I do ask you, whether those eleven pages of typewritten description and claims were typewritten before Mr. Liddell signed the folder and made the oath on the folder on January 7th, 1896, on the one hand, or whether, on the other hand,
74 those eleven sheets of typewriting were made after Mr. Liddell signed the folder and made the oath on the folder on January 7th, 1896?

[*Objected to as answered over and over again.*]

A. I have already answered this question repeatedly, and I again repeat that the pages referred to in your question were typewritten before Mr. Liddell signed the folder and made the oath on the folder on January 7th, 1896.

x-Q. 122. Now, you have at last committed yourself on that point, please to state whether you know of any means by which your testimony on that point can be corroborated?

A. It is corroborated by the general facts of the case, that is, the circumstances surrounding the presence of Mr. Liddell in Philadelphia for this express purpose and no other, it is also in accordance with the practice of the preparation of cases for the Patent Office as carried on in my office, and it is corroborated by the notarial certificate on the application.

x-Q. 123. How does the notarial certificate on the folder prove that those eleven sheets, rather than some other description and claims, was referred to by that notarial certificate?

A. The notarial certificate is indicative that the application was in proper shape when executed, and stands in the same relation as the notarial certificate to the execution of any document.

x-Q. 124. How does the notarial certificate disprove the possibility that you changed the sheets of the specification and claims from one set to another after the oath was taken and the notorial certificate was executed, in view of the fact that the notarial certificate was on the folder which folder did not have written upon it any portion of any description or claim?

A. Your last statement is not true, and your first inquiry relates to matters of law relative to which I am not here to testify.

x-Q. 125. But you undertook to testify that the notorial certificate stands in the same relation to the eleven sheets of typewritten specification and claims as any other notarial certificate stands to the execution of any other document. But as you now seem to think that answer was outside of your function to give, I will ask you what evidence, if any, exists that you did not remove from the folder (after Mr. Liddell signed the folder, and after the notarial certificate was executed), whatever papers may have been between the two leaves of the folder when Mr. Liddell signed the folder, and substitute therefor, some time between January 7th and January 27th, 1896, the eleven typewritten sheets which you sent to the Patent Office on or about January 27th, 1896, between the two leaves of the folder?

A. The conditions stated in my answer to x-Q. 122.

x-Q. 126. Will your brother, Ernest Howard Hunter, corroborate your statement that the identical eleven sheets which you sent to the Patent Office between the two leaves of the folder on

January 27th, 1896, were between the two leaves of the folder when he administered the oath to Mr. Liddell and made the notarial certificate on the folder on January 7th, 1896?

A. I have not discussed the matter in any sense with my brother, and know nothing about what he will say.

x-Q. 127. Will you please to refrain from mentioning the matter to him until after he has testified in this case, or until after the time for taking his testimony has passed?

A. I am not interested in the matter at all, and I do not suppose I will have any occasion to bring the matter to his notice.

[*Defendant's counsel hereby requests the present witness not to talk with Ernest Howard Hunter relevant to the history of the Liddell application No 578291 which he has spoken of in this case as the Liddell Case A, until after Ernest Howard Hunter has testified in this case, or until after the complainant's evidence in rebuttal is closed.*]

x-Q. 128. Have you consulted any typewriter operator who was in your employ in January, 1896, for the purpose of ascertaining whether you could prove by such a person when it was that the eleven sheets of specification and claims which you sent to the Patent Office on or about January 27th, 1896, between the two leaves of the Liddell folder of January 7th, 1896, were typewritten?

A. No.

x-Q. 129. Do you know the name of the typewriter operator who did those eleven sheets of typewriting in January, 1896?

A. No, I cannot say now by whom they were written.

x-Q. 130. How many typewriter operators were at work in your office on January 6th, 1896?

A. Two or three.

x-Q. 131. Please give the names of those persons?

A. I do not know that I could positively, as I do not recollect just when the operators came or left the office. I can only guess at it if that will satisfy you.

x-Q. 132. Please to guess at it, and state the result of the guess?

A. William L. Evans and R. M. Kelly.

x-Q. 133. Did you have no lady typewriter operator in your office in January, 1896?

A. Yes; R. M. Kelly is a lady.

x-Q. 134. Where is Thomas L. Evans now?

x-Q. 134. Where is Thomas L. Evans now?

A. I don't know.

x-Q. 135. Is he in business in Philadelphia?

A. That I do not know.

x-Q. 136. How long since you have seen him?

A. Possibly a year. He left Philadelphia, and subsequently called to see me when in the city. I do not know his present whereabouts.

x-Q. 137. Where is the lady, R. M. Kelly, now?

A. In Philadelphia; she lives in 24th street near Sansom street. I do not recall the number.

x-Q. 138. Is she employed by you at present?

A. Yes.

x-Q. 139. Has she been employed by you ever since prior to January 7th, 1896?

A. She has been employed since she came to my office but I do not know now whether she was there at the date you mention. I am simply guessing at that for your satisfaction.

x-Q. 140. Was Thomas L. Evans in your office January 7th, 1896?

A. Yes, he must have been there, as I think you will find his signature on one of the drawings as a witness.

x-Q. 141. But it does not appear that any signature was attached to any drawing on January 7th, 1896, and it does appear in Complainant's Exhibit Hunter File Case A, that the signature of Mr. Evans is absent from all the drawings in the case at the times when the blue prints shown in that file were made from those drawings, so that the presence of Mr. Evans' name upon the drawings of the patent does not prove that he wrote his name on the original drawings on January 7th, 1896. Indeed, it clearly appears from the evidence already in the case that the name of Thomas L. Evans was not written on the drawings even as early as January 27th, 1896, and that the drawings were returned to you by the Patent Office on January 28th, 1896, because they had not been fully witnessed at that

time. Thus you see that you are entirely in error in inferring that Mr. Evans was in your office on January 7th, 1896, from the fact that his name appears upon the drawings of the patent. I venture to suggest that much of your testimony is open to this same objection of being based upon inferences which may be as unfounded as your answer to x-Q. 140. Please, therefore, discontinue drawing inferences, and confine yourself to facts, and begin by stating whether Thomas L. Evans was in your office on January 7th, 1896.

A. My recollection regarding the typewriters was asked, and I merely stated that it was my impression that Mr. Evans was there, and this impression was in a measure corroborated by the fact that his signature appears on the drawings, notwithstanding all that you say in your question. However, I think I have matter here by which I can absolutely determine this point. I find that Mr. Evans was employed in my office on January 7th, 1896, and prior, for the letter which was sent to Mr. Haverstick on January 3rd, 1896, was signed by Mr. Evans, and his initials "W. L. E." appear under my name on the letter in the letter-press copy book.

x-Q. 142. Where is Henry Drury now?

A. In Philadelphia. He has just moved his offices to 926 Walnut street, third floor.

x-Q. 143. Have you consulted with Henry Drury, Thomas L. Evans, or the lady, R. M. Kelly, during the last year relevant to the application for the Liddell Patent 558,969, which application you have designated as Liddell Case A, and which you sent to the Patent Office on or about January 27th, 1896, and which received there the serial number 578,291, when it was filed February 6th, 1896?

A. I have not consulted Mr. Evans, but I have consulted both Mr. Drury and Miss Kelly.

x-Q. 144. Did Drury have any knowledge or means of knowledge upon the question when the eleven typewritten sheets of specification and claims were typewritten, which eleven sheets you sent to the Patent Office about January 27th, 1896, between the two leaves of the Liddell folder?

[*Objected to as without foundation, as utterly incompetent, an effort apparently to make Mr. Hunter testify for Mr. Drury and anticipate his testimony, also as calling for hearsay, if for anything in the way of evidence; also as it isn't shown that Mr. Hunter knows what Mr. Drury knows or knew, and even if he did, his recital thereof cannot be called for as evidence.*

[*Mr. Walker takes the ground that this question is admissible because the witness has already testified that Mr. Drury was not employed in his office, but worked in an office of his own two blocks away; thus raising the possibility, and indeed the probability, that Mr. Drury had no means of knowing when eleven particular sheets of typewriting were made, which were made in Mr. Hunter's office, and thus indicating the possibility that Mr. Hunter may know that Mr. Drury had no means of knowledge on the subject.*]

A. He had no knowledge that I know of.

x-Q. 145. According to the regular course of business in your office, and assuming, for example, that the eleven sheets of typewriting were done in your office by Thomas L. Evans, or by the lady, R. M. Kelly, would any record be kept in your office of the particular time when that particular typewriting was done?

A. No. The only time is when typewriting is done from notes taken stenographically.

x-Q. 146. Is there any way to prove when those eleven pages of typewriting were done otherwise than by your own testimony based on recollection?

A. Not that I am aware of.

x-Q. 147. Have you read the article about yourself and your doings and statements, which was printed yesterday, July 26th, 1903, covering page 1 of the literary section of the New York Herald?

[*Complainant's counsel objects to the question as utterly immaterial, a waste of time, not proper cross-examination nor proper examination of any kind, and notifies defendant's counsel, Mr. Walker, that if this method of examination is persisted in, the record will be certified to the Court to obtain a ruling as to whether this kind of cross-examination will be allowed*

by a Federal Judge, and whether complainants shall be put to the expense of attendance, typewriting and printing such improper cross-examination.

[Mr. Walker states to the Court that x-Q. 147 is the first of a series of questions which Mr. Walker proposes to put to the witness for the purpose of throwing light upon the question whether the unsupported testimony of the witness in this case can be relied upon as substantially true. And Mr. Walker takes the ground that it is proper on cross-examination of a witness to investigate the question whether he is habitually careful and accurate in his statements of fact, or whether he habitually puts forth imaginary and exaggerated statements upon matters of fact claimed by him to be within his knowledge. In other words, Mr. Walker states to the Court that he proposes and expects to be able to show by this line of cross-examination that this witness, though a man of brilliant intellect, is so far under the dominion of his imagination that no reliance can be placed by the Court upon any uncorroborated part of his testimony in this case.

A. I have.

x-Q. 148. Did you also read the continuation of the same article which appears on the last quarter of the following page of the same newspaper?

[*Same objection.*]

A. Yes.

x-Q. 149. Did you furnish all the information to the New York Herald which is stated in that article relevant to you and your doings?

[*Same objection.*]

A. The representative of the New York Herald came to Philadelphia to see me on two occasions with reference to the preparation of that article, which I saw for the first time after it was published. He prepared the article to suit himself, but, as far as I recollect, any matters which he has quoted as having been said by me were said by me substantially as reported. The rest of the article was made up by him, and facts stated therein

were evidently gotten from the Cyclopaedia of American Biography.

x-Q. 150. I call your attention particularly to the matter printed within an enclosure of printers' rules about three inches long by two inches wide, and headed "Claims for the New Alchemy," and containing ten printed lines under that heading; and I ask you to state whether you gave to the New York Herald the statement of claims for the new alchemy which is set forth in that particular space?

[*Same objection.*]

A. I did not give them in that language, but the statements contained therein are in the main substantially correct. They are correct so far as they may correspond to the matters in the article which are purported to be a quotation of the interviews.

x-Q. 151. I also call your attention particularly to the other parallelogram of space enclosed in printers' rules, about three inches long by two inches wide, and headed "The Alchemist," and I ask you to state whether you furnished to the New York Herald the information contained in that space under that heading, which information begins with the following: "Rudolph M. Hunter has been granted 360 patents at Washington."

[*Same objection.*]

A. I had no conversation with the representative upon the matters mentioned in the present question. He evidently took that from some data which he had.

x-Q. 152. Do you now claim to have been granted 360 patents at Washington?

[*Same objection.*]

A. I do not know how many patents I have nor how many were filed which have not yet issued.

x-Q. 153. Did you ever tell anybody, or write to anybody that the number of patents granted to you at Washington was 360?

[*Same objection.*]

A. No.

x-Q. 154. Do you disavow all responsibility for that statement?

[*Same objection.*]

A. Yes, because I was surprised that he should even have exact figures, because I did not have them myself.

x-Q. 155. In what year was the first patent granted to you?

[*Objected to as incompetent.*]

A. I think it was on an application filed in 1878 or 1879, and it must have issued about the same time.

x-Q. 156. What was the subject of that patent; I ask this question in order that I may look it up?

[*Same objection.*]

A. It was a chemical case involving the manufacture of gas, —involving the oxidation of iron ore.

x-Q. 157. I now call your attention to the next statement under the head of The Alchemist, which reads as follows: "Perfected Philadelphia trolley system." Do you claim to have been the inventor of the Philadelphia Trolley System or of any trolley system?

[*Same objection as above.*]

A. I claim to be the inventor of the trolley system in every material part, and I hold to-day patent claims which cover broadly every material part of it.

x-Q. 158. Do you mean by the phrase "the trolley system" the overhead trolley electric railroad which are used throughout the United States at present, and are well known to people generally?

[*Same objection.*]

A. I do.

x-Q. 159. Now, Mr. Hunter, it is true, is it not, that your relations to the overhead trolley electric railroad was the subject of interference in the Patent Office between you and Charles J. Van Depoele;

and that the Patent Office decided that Van Depoele and not you was the true inventor of the distinguishing characteristics of the overhead trolley system; and it is also true, is it not, that, although the Thomson-Houston Company or the General Electric Company became the owner of the Van Depoele patent and also became the owner of such patents as were granted upon your application on the trolley system, no suit was ever brought against anybody on any Hunter patent, but that many suits were brought and prosecuted successfully on the Van Depoele patent, with the result of the Court deciding that Charles J. Van Depoele was the true inventor of the distinguishing characteristics of the well known trolley system?

[*Objected to as entirely outside any legitimate cross-examination, and also as incompetent, these various matters by the statement of the question being matters of record.*]

A. I was in interference with Van Depoele on a specific limited construction, and never on the broad invention of the trolley system. I had broad patents issued to me on the trolley system prior to any intesference with Van Depoele, and these patents were never in contest with him. That particular interference was not prosecuted by me.

[*Recess until 2 P. M.*]

AFTER RECESS.

x-Q. 160. Do you really claim that you were the true and original inventor of the overhead trolley electric railroad system in every material part as that system is in general use in the United States at present?

[*Same objection, also as very indefinite.*]

A. I do.

x-Q. 161. I now call your attention to the following additional matter in the space headed with the heading of The Alchemist in the New York Herald of yesterday, namely, "Made the following invention: Alternating transforming system of electrical transmission, Trolley Conduit and Electrical Accumulator System of Electric Railways, series multiple con-

troller, electric brakes, electric car-heating device, an early form of arc lamp, a pioneer in manufacturing smokeless powder, original penny-in-the-slot machines, etc." And I ask you if those statements are true of yourself as would appear from the matter printed under the head of The Alchemist in the New York Herald?

[*Same objection as before.*]

A. In a general sense, they are all strictly true.

x-Q. 162. Am I right in understanding that the alternating transforming system of electrical transmission referred to is the now well known plan of generating alternating current electricity at a very high voltage and comparatively low volume, such as 10,000 volts, for example, and transmitting that current to a long distance over a comparatively small wire and then transforming it by what is sometimes called a converter or sometimes called an induction coil, to a current of low voltage and large volume, instead of the current of high voltage and low volume sent over the main wire?

[*Same objection.*]

A. You are. I hold the broad patents on this subject.

x-Q. 163. Now, Mr. Hunter, it is true, is it not, that that transforming system is practically indispensable to the transmission of large amounts of electrical energy through long distances, and that that system is employed in transmitting from Niagara Falls to Buffalo the enormous amounts of electrical energy which are being generated at Niagara Falls and sent to Buffalo for use in that city?

[*Same objection.*]

A. In a general sense, yes, but you are wrong in your supposition that the electricity is generated directly at high tension and transmitted with that tension to Buffalo and then reduced in tension where it is consumed. The fact is that the Niagara Falls plant use a modified system, which I also hold the broad patents on, which is known as the "step-up and step-down" transformer system, that is, after the current is first generated in the generator, it is raised to a very much higher potential by

static converters, and then that high tension current is transmitted to Buffalo and then reduced in potential to the tension required, which is usually very much lower than the initial potential produced at the generator.

x-Q. 164. Am I right in understanding that the distinguishing characteristics of the alternating transforming system of electrical transmission consists in the fact that, by means of that system, a current of any voltage, high or low, and of any amperage, high or low, can be transformed into any other current of any voltage, high or low, and any amperage, high or low, provided the watts of energy remain the same, which watts of energy result in any case from multiplying the voltage by the amperage, and disregarding incidental losses and speaking only generally?

[*Same objection, and as a waste of time.*]

A. Your question is a very general one, and is so broad that it goes beyond what is understood as the transformer system of commercial practice. This system involves the reduction of potential at the place of consumption by the use of transformers. It does not involve the increase of potential at the place of consumption, which is included in your question. I recall no instance where the increase of potential is called for at the place of consumption.

x-Q. 165. It is true, is it not, that the decrease of potential at the place of consumption is an element of vast value and importance in the transmission of electrical energy for power purposes over long distances?

[*Complainant's counsel objects to this line of examination as utterly outside any proper cross-examination, wandering off into the electrical field without any basis for such questions, and as complainant's counsel deems it necessary to draw the line somewhere, on Mr. Walker's vagaries in the form of cross-examination, he draws it here and instructs the witness that until the matter is submitted to the Court in the proper way at the instance of defendant's counsel, and the witness directed to answer this question and others like it, which complainant's counsel incidentally does not believe will ever be the case, he,*

the witness, may submit that he declines to answer the question until instructed by the Court.]

A. It invariably is.

x-Q. 166. Now, Mr. Hunter, it is true, is it not, that the question whether you or Gaulard and Gibbs were the true inventors of that element in the transmission of electrical energy was involved in an interference in the Patent Office many years ago, and was decided in favor of Gaulard and Gibbs, and specifically against you, and that no Court or other authority has ever reversed that decision?

[*Objected to as incompetent and immaterial.*]

A. That broad invention was never in controversy between Gaulard and Gibbs and myself. A specific issue under it was, and that interference was not carried to the higher tribunals by me, as those who controlled my invention and application owned the Gaulard and Gibbs patent. The broad claims on the process and apparatus were granted to me, and some of these are controlled by my assignees, while the broadest of them I still own.

x-Q. 167. If you are right in your last statement, I should judge that the patent or patents containing those broad claims should be worth at least a thousand million of dollars; please to state whether that estimate is not a moderate one?

[*Same objection.*]

A. No, certainly not.

x-Q. 168. About how much advantage does the electrical world derive every year at present from that scheme or plan of which you say you still own the broad and broadest claims, namely, the transforming of current of alternating electricity from high tension to low tension at the places of consumption of such currents?

[*Same objection.*]

A. I do not profess to know.

x-Q. 169. It is true, is it not, that that is one of the most valuable electrical inventions which are in use in the world at present?

A. I think it is.

x-Q. 170. What is meant by the "conduit" system mentioned in the New York Herald as one of your inventions?

A. It is the system of electrical railway in which a slotted conduit arranged along the track adjacent to the rails is employed for supplying current from conductors within the conduit to the car for operating it.

x-Q. 171. Am I right in understanding that you claim to be the original and true inventor of that electrical conduit system of which the Metropolitan Street Railway in New York City is one example?

A. I have made some pretty broad inventions upon that system and have some very broad patents upon it, but at this moment do not say positively that I was the first to bring out the broad idea, although I am not prepared to say that I am not.

x-Q. 172. It is your present belief, is it not, that all the electric conduit street railroads, such as that of the Metropolitan Street Railroad Company constitute infringements of your patents, or of some of your patents?

[*Same objection.*]

A. I have given no special consideration to that question, as those railroads are built with the sanction and authority of my assignees, and I assume there never has been any conflict involving the question.

x-Q. 173. What is meant by the "accumulator system of electric railways" stated in the New York Herald to be one of your inventions?

[*Same objection.*]

A. It is the system in which electrical accumulators or storage batteries are carried upon the car for supplying current to the motors under the control of a controller.

x-Q. 174. Do you claim to be the true and first inventor of that syste also?

[*Same objection.*]

A. I have some very broad patents covering that system, and was instrumental in building the most modern types of cars

employing it. My patents unquestionably cover the system pretty fully in its commercial form.

x-Q. 175. Am I right in understanding that the "series multiple controller" mentioned in the New York Herald as one of your inventions, is the controller in general use throughout the United States on the platform of electric cars, and by means of which controller the motorman governs the starting and stopping of the car and also the direction and speed of its motion?

[*Same objection.*]

A. It is with this understanding, that my invention of a series parallel controller was the broad invention, and was modified by Mr. Condict, superintendent of the Electric Car Company of America which I organized to manufacture my inventions, in which he adapted my invention to our cars by incorporating the resistances and series parallel switch devices under the control of a single handle for convenience in operation.

x-Q. 176. Have your electric brakes gone into general use on electric railroads also?

[*Same objection.*]

A. Electric brakes are not used to any material extent, and while some use was made of this system of braking, separate air brakes are now employed in place of electric brakes.

x-Q. 177. Have your electric car-heating devices been used extensively in the winter on electric cars in the United States?

[*Same objection.*]

A. They are used almost everywhere.

x-Q. 178. Did you precede Mr. Brush in inventing the electric arc lamps which he is sometimes accredited with introducing to the world, and which have gone into extensive use in Europe and America?

[*Same objection.*]

A. No; his invention was made about 1877, and my first electric lamps were invented in 1879, or thereabouts.

x-Q. 179. Were you the first to invent a penny-in-the-slot

machine? Or, in other words, a coin-operated machine, thousands of specimens of which are to be seen in the great cities of the United States.

[*Same objection.*]

A. I was quite early in the field, as my patents have long expired, and I had perhaps the broadest claims ever granted on that subject to cover the modern nickel-in-the-slot machine.

x-Q. 180. Unless you are mistaken about the primacy and the breadth of your inventions and patents, it would appear to me that you ought to receive by this time at least Five hundred million dollars for them; and, indeed, I think that a thousand million dollars would be a very low estimate of the value of those inventions and patents. Please to state whether my estimate is not a very moderate one?

[*Same objection.*]

A. I do not put absurd valuations upon patents. A patent is worth all you can make out of it, but it frequently costs pretty nearly as much to enforce its recognition as the profits will amount to. No proper estimate can be made upon inventions of this character which have taken twenty years or more to become extensively universally used.

x-Q. 181. Mr. Hunter, I have looked up your record with close investigation, and I have found that the number of patents which have been granted to you is not 360 or 300, but is 259, and I have also found that no one of your patents has ever been sustained in any Court in any case the report of which has ever been published in the Federal Reporter, which publication, as you probably know, has published all patent decisions which have been rendered in writing by any United States Circuit Court since the year 1879. Now, assuming the correctness of this statement (which the Court can verify by consulting the records), I ask you if I am not justified in thinking that your claims as a great inventor in electric railroads and many other departments of the useful arts, are not somewhat exaggerated in your own mind?

[*Same objection.*]

A. You are totally incompetent to know anything about my claims. Furthermore, I have not made any statement that I was a "great" inventor; my reputation is evidenced by my work. I have made no claim at any time as an original and first inventor in these matters that I am not able wholly to sustain. I do not own my patents, and most of them have been controlled since 1885 by others, and I therefore have no jurisdiction over them for the purposes of bringing suits and otherwise using them against the public.

x-Q. 182. I now call your attention to those statements in the New York Herald of yesterday which relate to your plans for transmuting silver into gold, and particularly to your statements that you have already transmuted silver into gold at a cost of conversion of 17 per cent., and that the profit by the conversion was about 585 per cent., and that the time occupied in the conversion was less than 30 hours and that the metal transformed was increased forty times in value by the transformance, and that the gold produced from the silver was 24 carat fine. Now, please to state if you really believe the statements contained in the New York Herald of yesterday on that subject of transmuting silver into gold?

[*Same objection.*]

A. The subject is a very serious one, and I am well aware that ninety per cent. of the people lacking proper education are disposed to doubt the statements contained in that article. I am speaking from actual knowledge, and I mean to say that the statements contained in that article are in all material particulars strictly true and correct. These figures are not guessed at, nor assumed, but are based upon careful tests by actual work.

[*Mr. Walker requests that the leaf of the New York Herald of Sunday, July 26th, 1903, which contains the article on transmuting Silver Into Gold," and which is referred to in the last answer, may be marked for identification, "Defendant's Exhibit, New York Herald Article, of July 26th, 1903," and it is accordingly so marked.*

[*Objected to as immaterial.*]

x-Q. 183. Now, Mr. Hunter, I have a few questions to ask you about your plans for transmuting silver into gold, but those questions will all be entirely serious and respectful, and they will not include any inquiry into any secret of yours, and will be confined to asking for some further explanation of some of the real or supposed science set forth in the article. To begin with, I inquire of you how you learn that an atom of silver consists of 75,600 ions, and how you learned that an atom of gold consists of 137,620 ions?

[*Complainant's counsel, while renewing his objections to this line of examination, and objecting to above question as utterly immaterial and not proper cross-examination, a waste of time and expense, also instructs the witness that, in the opinion of complainant's counsel, no Court would allow such a question on this examination, and that witness is at liberty to decline to answer it until ordered to answer by the Court, if he so desires, and also is not bound to answer inquiries into the details or even the theories relating to his secret process.*]

A. I do not wish to appear to want to avoid any question that is proper, and I will, for the sake of answering the question, state that the relation of the ions in gold and silver bear a proportional relation between their atomic weights. Beyond this, I will not discuss the subject, in view of the statement of counsel.

x-Q. 184. Am I right in understanding your last answer to mean that the ions in an atom of silver bear the same proportion to the ions in an atom of gold as the atomic weight of silver bears to the atomic weight of gold?

[*Same objection.*]

A. That is correct.

x-Q. 185. Have you any other ground than that for saying that the particular number of ions in an atom of silver is 75,600, while the particular number of ions in an atom of gold is 137,620?

[*Same objection.*]

A. I have nothing further to say on that subject. It is purely theory on the ultimate atom in any event, and it would be waste of time in this case to discuss it.

x-Q. 186. It has generally been believed heretofore, has it not, that an atom of silver and also an atom of gold is an elementary unitary thing, having no further analysis and incapable of further subdivision?

[*Same objection.*]

A. Not by scientists or men of original research, but only by the masses and people who learn from books.

x-Q. 187. It is true, is it not, that the atomic theory of matter which originated about a hundred years ago held that view of the unitary and elemental character of atoms of gold and silver, and that the theory of atoms of gold and silver being themselves composite of tens of thousands of ions is a very recent theory to be held by anybody?

[*Complainant's Counsel must decline to permit his client to be subjected to the expense involved in such absolutely immaterial and improper cross-examination, as is being indulged in by Mr. Walker, and instructs the witness that he should not answer this question until it is submitted to the Court and an answer ordered.*]

[*Mr. Walker states to the Court that the line of inquiry is believed to be quite proper because it tests the question whether the witness is to be relied upon when he attempts to infer facts from other data than the facts themselves, and because the question of his reliability in that behalf is material to the question whether the more important parts of his testimony relevant to the paper bag machine patent in suit can be relied upon, as that of a careful and common sense man, on the one hand, or whether, on the other hand, the witness is one of those geniuses who, however brilliant and suggestive his mind may be, is quite deficient in solid reasoning power. Mr. Walker states to the Court that he does not wish to use any disrespectful terms upon this matter, but that he does wish to be permitted to cross-examine the witness in ways perfectly well recognized in the law books as being proper methods of cross-examination.*]

[*Complainant's counsel must decline to allow advantage to be taken of the method of giving this testimony out of Court and beyond judicial control, to ask questions which no Judge in open Court would permit for an instant, and even Mr. Walker would not dare to ask.*]

A. It is true that the atomic theory as commonly exploited in the text books is of ancient origin, as it were, and is dependent upon the immature chemical knowledge, whereas the more advanced theory of the ions, which has come to the front in later years by scientists is not limited by the narrow lines which surround the old atomic theory.

x-Q. 188. Please to state in general terms, and as far as you are both willing and able, how it is that you propose to divide an atom of silver into its 75,600 ions and afterwards to make an atom of gold out of those ions, or some of them?

[*Same objection and instruction to the witness.*]

A. Feeling that complainant's counsel does not wish me to answer these questions which relate to purely theoretical matters, I must decline to answer until instructed by the Court. Personally, I have no objection whatever to answering any question on this subject of transmuting silver into gold except to disclose the actual secret of the process.

x-Q. 189. Has it ever occurred to you that, by transmuting all the silver now in the possession of mankind, into gold, with the proportionate result specified in the Herald article, you would be inflicting upon mankind an overwhelming and irreparable evil by reducing the purchasing power of gold nearly down to the present purchasing power of silver, and thus robbing widows and orphans who depend upon the principal and interest of debts due them for bread, and also deranging the trade and commerce of mankind to an extent from which it could not possibly recover for at least a hundred years, and generally ruining every creditor in Christendom for the benefit of their debtors?

[*Same objection and instruction to the witness.*]

A. Under instruction of counsel, I decline to answer unless instructed by the Court to do so.

x-Q. 190. Why did you wait from January 7th, 1896, when Mr. Liddell signed the folder and made the oath on the folder in the Liddell application in Case A, before you sent that application to the Patent Office at all?

A. As before stated, I had not been paid the fees on the case, and I did not care to advance them until I received some assurance of receiving a check.

x-Q. 191. Was this unwillingness to advance that Patent Office fee due to your being short of money at the time, or was it due to doubt of its repayment?

A. I could not answer that question, but it is seldom that I will send any case to Washington until I receive the fees.

x-Q. 192. The Patent Office fee that you did send on January 27th, 1896, was only $15, was it not, and it was sent in your own check, was it not?

A. That is true, but I had done a great deal of work in connection with the case, and had also paid out the money for the drawings and for all the office expenses connected with it, and I did not feel called upon to pay out additional money to the Patent Office. In any event, it is not my practice to do so.

x-Q. 193. You knew, did you not, that Mr. Haverstick simply represented the Eastern Paper Bag Company, and it is a fact, is it not, that you knew that Mr. Liddell had assigned to the Eastern Paper Bag Company whatever inventions were put in your hands to be patented?

A. It does not appear that my office had anything directly to do with the Eastern Paper Bag Company, as everything was charged to Ide, Haverstick & Company, and while it appears from the patent that it was assigned directly to the Eastern Paper Bag Company, I can only assume that it was so assigned with the sanction and desire of Ide, Haverstick & Company, and that they must have represented the Eastern Paper Bag Company in that connection.

x-Q. 194. It is true, is it not, that Ide, Haverstick & Company were a firm of merchants in Philadelphia having an established place of business only a few blocks from your office, and having good, commercial credit in January, 1896?

A. I don't know anything about what their credit was at that time, and, on the other point, they had an office reasonably near mine in the same city, but I never was in it that I recall.

x-Q. 195. Did you, as a matter of fact, at any time within two weeks after January 7th, 1896, send any bill to Ide, Haverstick & Company, or anybody else, for services rendered or fees to be paid in connection with the Liddell Case A, or in connection with the Liddell Case B, or did you, at any time within those two weeks, do or say anything to ask or to induce Ide, Haverstick & Company to send you any money on account of either of those cases?

A. I personally do not send out the bills, and I could not answer the present question from memory, but from the practice of my office I feel certain that the fees were requested promptly.

x-Q. 196. According to the practice of your office, would that office contain any record or memorandum of that request and show the time when it was made?

A. Not necessarily, because the requests are frequently made orally, either directly or over the telephone.

x-Q. 197. Does your office contain any record or memorandum to show when it was, after January 7th, 1896, that Ide, Haverstick & Company, or anybody else, paid any money on account of the Liddell Case A, or the Liddell Case B?

A. Yes, it shows that the money was paid, I think, on the 28th or 29th of January, possibly after it had been requested and the assurance given that the check had been sent.

x-Q. 198. So that you did finally advance the money for both Case A and Case B to go to the Patent Office before that money was paid to you by Ide, Haverstick, or anybody else; is that so?

A. Yes, possibly immediately after being assured that the money was sent or being sent.

x-Q. 199. You have testified that you sent Case B to the Patent Office on January 20th, 1896, and sent Case A to the Patent Office on January 27th, 1896, and now please to state why you did not send Case A at the same time that you sent Case B?

A. I possibly thought that to advance one fee was sufficient at the time, besides we frequently file cases of the same general nature and name on different days so as not to have the same record date, for convenience in keeping them separated in prosecution.

x-Q. 200. It seems to me that neither of those reasons could have been the true reason, because the fees advanced were so small anyhow, and because you were so rich in the ownership of millions of dollars worth of inventions at the time, according to your own account, and because Ide, Haverstick & Company were perfectly responsible parties for as much as $30, and because you did advance both fees, according to your own account, although not on the same day, and because, if you were going to send the two applications to the Patent Office on different days in order to give one a number prior to the other, you would have been likely to have given the earlier number to Case A instead of to Case B, and because you would not naturally make more than one day of difference between the time of filing the two applications, and because you have testified that there was a special reason for promptness and speed in respect of securing the rights of the assignee of Mr. Liddell in the two inventions; and I inquire of you whether you can detect any error in my reasoning on this point?

A. I do not see that your reasoning is good at all. In the first place, the promptitude of preparing the applications was with the desire to secure the signatures of William Liddell, who my clients were afraid would not perform his duty under the old contract. The anxiety was not to rush the cases into the Patent Office. Furthermore, the marking of the cases "A" and "B" were simply arbitrary, and either one might have been marked "A" and "B" as they happened to lie on the desk, and as I did not personally mark them as Cases A or B, that I know of, I can see no reason for Case A being filed first. Furthermore, if assurance was given that the fees would be sent, and after filing one case the fees did not turn up, the next day at least, I would not be likely to file the second case until I had received the fees, or some good assurance that they would be forthcoming promptly. It is not the question of the Govern-

ment fees alone, but it is paying out those fees on top of the cost and expenses already put to in the preparation of the cases. Specially, as there were several sheets of drawings in these cases, and considerable work.

x-Q. 201. In January, 1896, you had lost a number of interferences, had you not, due to the fact that you had delayed to file your applications in the interference; and you had learned from that experience and knew perfectly well, did you not, that danger always resides in delay in filing applications for patents after those applications are ready to be filed; because, in the Patent Office, the decision of interferences often depends upon comparative dates of applications for patents?

A. My experience in the loss of cases by failure due to lack of diligence in filing was not dependent on a few days, but generally went into months and years. In the cases in hand, I knew of no reason why there should be any possible interference with Liddell's invention, and I do not give that subject a moment's thought in preparing and filing an application unless my client particularly refers to the possibility of an interference.

x-Q. 202. In January, 1896, you knew, did you not, that delays in filing applications for patents after they are ready to be filed are always more or less dangerous, and are never beneficial; and you knew, did you not, from decisions of the Commissioner of Patents which had been rendered in your own cases, that, in the absence of any reduction to practice prior to filing applications, the application in interference first to be filed is *prima facie* ground for a judgment of priority in favor of that application, which *prima facie* ground of judgment is difficult to overcome, and sometimes impossible to overcome even by an applicant in interference who was really the first inventor of the invention in interference, and you knew perfectly well, did you not, in January, 1896, that even one day's difference in date of application between interfering applications might regularly result in awarding the patent to the first applicant, though it would have been awarded to the other applicant if the other applicant had been one day ahead in date of filing?

A. All that you say is fairly true as to conditions that are

possible, but I do not believe that it is my place to worry myself about possibilities of interference when no indication of such interference is in sight, and especially so when a client does not think enough of his own case to at once pay the fees that are necessary to file the application.

[*Adjourned to Tuesday, July 28th, 1903, at 10:30 a. m.*]

NEW YORK, July 28, 1903.

[*Met pursuant to adjournment.*]

Present: Counsel as before.

RUDOLPH M. HUNTER, *resumes.*

Cross Examination continued by MR. WALKER:

x-Q. 203. In the fourth paragraph of your answer to Q4, you state that on September 23rd, 1895, Mr. Liddell called at your office and brought with him such sketches as he had made of three paper bag machines; and that your brother asked you to give those cases your attention, because he was busy on other matters, and that your brother brought the manilla drawings into your room and placed them on your desk, after showing you what they were, and that you at once sent for your draftsman and delivered the drawings to him, requesting that he should prepare from them suitable Patent Office drawings. Now, please to state whether Mr. Liddell came into personal contact with you on that day?

A. He did not; he was shown into the front office occupied by my brother, whereas my offices are separated from his by the main office and a considerable passage or hallway, and much more secluded. I could, however, see from my office directly into his room, and I recall the fact of Mr. Liddell being shown into my brother's room, and did not deem it at all necessary at the time to leave what I was doing to go in to talk to Mr. Liddell. The reason I remember Mr. Liddell going into my brother's office, is from the fact that he (my brother) afterwards brought the drawings in to me, and these cases are the only paper bag machine cases I remember giving any personal attention to for perhaps a year or two about that time.

x-Q. 204. About how long was Mr. Liddell in conference with your brother on that day?

A. I do not recollect, but do not think it was very long.

x-Q. 205. Were those manilla drawings explained to you on that day any further than was involved in your brother's statement that they were some drawings of Mr. Liddell for paper bag machinery?

A. My brother undoubtedly gave me some explanation of them, for I do not think it is possible that I would have accepted the drawings without some explanation to enable me to know what they were and what he wanted me to do. While I can read drawings very quickly, it is not my custom to attempt to write up specifications without some explanation.

x-Q. 206. Was Henry Drury the draftsman to whom you delivered those drawings with a request that he should prepare Patent Office drawings from them?

A. He was.

x-Q. 207. Do you now remember any explanation which you may have made to Mr. Drury at that time to guide him in making those Patent Office drawings from the manila drawings of Mr. Liddell?

A. I gave Mr. Drury some brief explanation which I thought was sufficient to make him understand the general nature of the inventions, so that he could intelligently make the Patent Office drawings from the manila drawings, but I did not go into the details so carefully as to observe the defects in the manila drawings from which Case A was to be prepared.

x-Q. 208. In the fall of 1895 was Henry Drury competent to learn from rough sketches and rather slight oral explanation the character of mechanism having such a degree of simplicity or complication, as the case may be, as that of the Liddell patent 558969 of April 28th, 1896; I mean to inquire whether he was one of those smart mechanical draftsmen who "catch on" quickly to the ideas of other men so as to translate their crude sketches into good Patent Office drawings readily, or whether he was a rather dull man who required detailed and carefully given information in order to make Patent Office drawings therefrom?

A. I would say that Mr. Drury is a careful, painstaking draftsman of good, ordinary intelligence, but I would not consider that he was "one of those smart mechanical draftsmen who 'catch on' quickly," to use your own language. In the cases then given him of Mr. Liddell the manila drawings were supposed to be sufficiently complete to enable him to make the Patent Office drawings without making any assumption as to what was possibly omitted or incorrect. It was not until after he was making the drawings that the difficulty with regard to Case A arose.

x-Q. 209. You have stated that on September 23d, 1895, you charged for three different applications, but that one of the three was dropped and the charge for it was cancelled in pencil from your books. Now please to state whether that case was dropped from further consideration before the other two cases were turned over to Mr. Drury, or whether all three cases were turned over to Mr. Drury and one of them was dropped afterward?

A. I do not recall ever considering the third case, and have no recollection whatever what it was about. In fact, I think that it must have been a case decided upon at the interview with my brother which was not followed up at all, although the charge for it was no doubt given by him to be put in the ledger and afterwards cancelled.

x-Q. 210. Who was it that decided to drop that case?

A. I do not know, unless it was my brother, for I have no recollection of it whatever.

x-Q. 211. In the fifth paragraph of your answer to Q. 4, you state that on October 10th, 1895, a letter was written by your brother in your name to Mr. Liddell, asking him to come to your office and make further explanations to your draftsman with regard to the details of construction of the Liddell paper bag machines, and in the following paragraph you state that on the first Tuesday after October 12th, 1895, Mr. Liddell did come to your office and explain to you in a general way what was required in connection with the drawings for Case A. I now ask you if you have any definite recollection at this time of anything that Mr. Liddell explained to you at that time in October, 1895?

A. I only remember that he explained that the movements of the parts were to be produced by cam action, and I told him that I had none of the drawings, either his or those Mr. Drury was making, at my office, and thought that he had better go down to Mr. Drury's office and explain to him directly and with the drawings before him what changes it was that were needed, so that Mr. Drury could complete the drawings. I anticipated no further misunderstanding between him and the draftsman, and therefore gave the matter no further thought at the time. I thought, however, that I understood what it was that Mr. Liddell wished to claim as his invention, and this is evidenced by the fact that the claims that I drew to cover his invention, when only having the defective drawings before me, are substantially the identical claims which issued with the patent when completed.

x-Q. 212. The record shows that you are in error in saying at the end of your last answer that the claims you drew when only having the defective drawing before you, are substantially the identical claims which issued with the patent when completed; and I will go into that subject in detail later, and show from the record your error in that behalf. But at present I want to confine your attention to what occurred in October, 1895, with a view to avoiding confusion. I therefore ask you which "movements of the parts" of the Liddell Case A you understood at your interview with Mr. Liddell in October, 1895, were to be produced by cam action, as it is evident that some of the parts of that machine, including the cylinder C and the gear M2 and many other parts, were to be continuously rotary without any cam action.

A. Regarding my statements with respect to the claims being the same, when issued, as when first prepared, I reiterate that, as the record shows it to be true, the changes in the claims being hardly more than typographical. With regard to the cam motion referred to at the interview with Mr. Liddell, I understood that it was with reference to the mechanism which carried and moved the forming plate, and I assumed that Mr. Drury would be able after talking with Mr. Liddell to make the necessary changes in this respect.

x-Q. 213. In the last mentioned paragraph of your answer to

Q. 4, you further proceeded to state that Mr. Liddell went to see the draftsman on the Tuesday following the 12th of October, and then went back home, and that the draftsman proceeded with his drawings, and had so far completed them on the 28th of October, 1895, that he charged your office for making the drawings for Case A and Case B. In the same connection you state that the drawings of Case A were still incomplete because the draftsman did not seem to remember what it was that Mr. Liddell desired should be incorporated in the construction to impart the necessary movement to the folder plate and the alternating arm. Thereupon you proceed to say that, notwithstanding the drawings of Case A were still defective, you went ahead and drafted the specification therefor, and later in your testimony you explain that the specification you drafted at that time was the purple typewritten matter (without the red ink amendments) which is contained in Complainant's Exhibit Hunter File Case A. Now, please to state, as near as you can, when it was that you drafted that original purple specification?

A. I could not say, except that it was done prior to January 3rd, 1896, but just when I cannot fix the date.

x-Q. 214. It is reasonable to infer, is it not, that the time of drafting that purple specification was very shortly before you wrote the letter of January 6th, 1896, to Mr. Haverstick, and certainly not more than a week before that day?

A. I could not say with regard to this. There is a possibility that after Drury sent the drawings to my office, I may have written this specification with the drawings as I found them, and it is quite possible that, knowing that it was defective, that I was in hopes of being able to see Liddell before going any further with his cases. As it was not easy to get hold of Liddell, I suppose that I finally, on January 3rd, sent the case as it was to Mr. Haverstick, and this was possibly due to some request on his part, but when that was I do not recall.

x-Q. 215. Have you any means of fixing the date whereon Mr. Drury sent to you the original drawing, without any reference letters thereon, and before you wrote the first draft of the specification?

A. I do not know of any means, except his charge, for I do not think that he would have made a charge for the drawings until he delivered them; at least, that is his practice, and I do not know of any deviation from it, so I presume that he must have had the drawings in some sort of completed form (with the defects) in the latter part of October.

x-Q. 216. Is there any means of tracing with certainty that original drawing back any further than January 3rd, 1896, when you sent the first blue print to Mr. Haverstick?

A. I do not know personally at this time of any way of definitely fixing the date on which the original drawing containing Fig. 1 only, was delivered to me by Mr. Drury, except by the date of his bill for making it, which I feel is good evidence that it was completed at that time, especially as there were a number of sheets in the case, and he would not have known what charge to make until after he had made the drawings, and, secondly, it is not his practice to send me a bill until he has delivered the drawings. The only other way of establishing the fact that this drawing was delivered in the latter part of October would be by the testimony of Mr. Drury himself.

x-Q. 217. Let us assume for the present that the original drawing was delivered to you on October 28th, 1895, and which original drawing you have already testified was in conformity to the first blue print except that it did not have any reference letters at that time, and had not at that time been changed from the character shown by the white lines on a blue ground in the first blue print. Now, assuming that date to be October 28th, please to state whether that drawing was in your possession all the time until January 3rd, 1896, except when it was sent back to Mr. Drury with the reference letters thereon in pencil, to have those reference letters inked in, and to have the first blue print made from the drawing thus provided with those reference letters; and which sending back to Mr. Drury you have stated occurred after you made the first draft of the specification?

A. As far as I know, the drawing was always in the possession of my office from the time it was delivered by Mr.

Drury (assumed to be October 28th), until the first blue print was made.

x-Q. 218. About how long was that original drawing out of your office when it was sent back to Mr. Drury to have the reference letters inked in and have the first blue print made?

A. I could not say; it takes very little while to make a blue print, as the original drawing is always saturated with benzine and is therefore quite transparent.

x-Q. 219. Now, we have carried the investigation so far as to develop your statement that at some time after October 28th, 1895, and on or before January 3rd, 1896, you had the original drawing before you in your office, and prepared the first draft of the specification. Now please to state whether in preparing the first draft of the specification, you were guided entirely by the drawings before you, plus whatever you remembered of what Mr. Liddell had told you, or whether you also had some assistance from Mr. Drury in interpreting as well as you could the original drawing.

A. I attempted to draw the specification from what I found actually shown in the drawing, supplemented by my recollection of what Mr. Liddell had told me, and also by the statements made to me by Mr. Drury, who very clearly admitted at the time that he did not understand just how the arm F and the forming plate mechanism was to work, but implied by his statement that it should be operated substantially as I described it in the original draft specification. I pointed out to him that the gears could not work as cams, and my recollection is that he stated that he could not help that, as he did not now know how then to change the drawing, but did know that Mr. Liddell wanted to use a cam motion to secure the operation of the parts, and I prepared the specification as best I could from this general information.

x-Q. 220. It is true, is it not, that when you prepared the first draft of the specification, you were not in possession of any other information, derived from Mr. Liddell, than was shown in the original drawing, supplemented by Mr. Drury's statement that Mr. Liddell wanted to use some kind of cam motions or other which were not shown on that drawing?

A. That is not correct. I had, in addition to the drawing Mr. Liddell's statements to me before going to see Mr. Drury, but because I expected him to get the details accurately shown by talking with Mr. Drury, I did not stop to make any sketches or take down accurate details from him, not deeming it necessary. When I drew the draft of the specification, I did not understand from Mr. Drury that there were only to be additions to the drawing, but was given the impression that the eccentric gears were incorrectly shown and should have been indicated as cams of some nature. That is the condition of the matter when I proceeded to draw the specification.

x-Q. 221. It appears in Complainant's Exhibit Hunter File Case A, that the first claim of the original specification read as follows, after it had been amended in pencil and before it had been amended with red ink:

> "1. In a paper bag machine, the combination of a rotating cylinder provided with one or more nippers, and one or more pairs of side-folding fingers adapted to be moved toward or from each other, a forming plate also provided with side-forming fingers adapted to be moved toward or from each other, means for operating said fingers at definite times during the formitive action upon the bag tube, and operating means for the forming plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder, the whole operating for the purpose of opening and forming the bottom of the bag tube."

Now, it is clear to me that the rotating cylinder specified in that original first claim, was the cylinder C of the original drawing, and that the "one or more nippers" of that claim refer to the nipped *c* on the cylinder near the arm F, and to the corresponding nipper *c* on the opposite side of the cylinder C; and that the "pairs of side-folding fingers" referred to in that claim are the side-folding fingers G; and that the "forming plate" referred to in that claim is the forming plate E, and that the "side-forming fingers" referred to in that claim are the fingers H, and that the "means for operating said fingers at definite times" is a phrase

referring to mechanism well enough shown in the original drawing for the duty of moving the side-folding fingers toward and from each other and also the duty of moving the side-forming fingers toward or from each other; and I ask you if I am right in having that opinion as to what parts of the original drawing were referred to by the original first claim down as far as the phrase "means for operating said fingers at definite times during the formative action upon the bag tubes?"

A. Your understanding is correct, with the further understanding that the claim is not limited to the precise constructions as shown, but would include mechanical equivalents.

x-Q. 222. Now, I call your attention to the last element of the original claim 1, namely: "Operating means for the forming plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder," and I ask you to state what devices were shown on the original drawing and are now shown on the first blue print, which were referred to by you when you framed that language to attend to that part of the machine. I do not ask you for any statement as to whether in the eye of the law that language would also cover mechanism not shown in the original drawing; I only ask you what mechanism which was shown in the original drawing was referred to by that language?

A. As the language was my own, it naturally referred to the parts which I considered were in some manner intended to impart that movement, and those parts were means defined in the specification as cam gears K, to oscillate the arm F simultaneously with the action of the gears N, M and M, the latter working in contact with a gear M' as a rack. That was the mechanism referred to by the language, although by the question marks on the specification and the memorandum annexed when sending the case to Mr. Haverstick, it was clearly understood by me that this mechanism was not complete or correct.

x-Q. 223. I call your attention to the fact that the same language, namely, "operating means for the forming plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder," is also used in Claim 2 and in Claim 3 and in Claim

4, and in Claim 7 of the original specification; and I ask you to state whether that language referred to the same parts in those claims that it referred to in Claim 1, and referred to those same parts in the same sense in all of the claims?

A. It does in a certain sense, but there is a distinction between Claims 1, 4 and 7 from the language of Claims 2 and 3, the distinction being this: Claims 1, 4 and 7 are not concerned in any manner with the returning of the forming plate to its original position to receive the next bag, it being understood in those claims that the action may be anything found suitable; whereas in Claims 2 and 3 means are specifically brought in for returning the forming plate to its original position, these means being stated as "power devices for returning the forming plate to its original position to receive a new bag tube." I consider, therefore, that the language of Claims 1, 4 and 7 particularly under consideration, might be legally construed as broader than the corresponding language in Claims 2 and 3, since in these claims there is a further restriction requiring the forming plate to return to its original position. This distinction may be purely technical, but it exists, nevertheless, and I can conceive of the possibility under Claim 1, for example, of there being more than one forming plate employed in an actual machine, which might involve a considerable difference in minor details.

X-Q. 224. What mechanism in the original drawing and in the first blue print was referred to by the following words which appear in Claim 2 and in Claim 3, namely, "power devices for returning the forming plate to its original position to receive a new bag tube."

A. They would be the same devices which caused the oscillation of the forming plate when operating upon the bag tube, but it would be a different operation of these same devices. The language, however, is broad enough to include any other possible devices which might be adapted for the purpose.

[*The last sentence of the answer is objected to as not called for by the question, and as assuming to construe the specified language of Claims 2 and 3 as being broad enough to cover every possible device which might be adapted for the same purpose.*]

x-Q. 225. I call your attention to the following language in original Claim 7, namely, "connecting mechanism for timing the movements of the rotating cylinder and the forming plate," and I ask you to specify what parts of the original drawing and the first blue print were referred to by that language in that original claim, and I ask you to omit to state any view as to what other mechanism performing the same function might be construed by the Court to come within the terms of that phraseology?

A. The parts M2, K, L, *f*, F. M', M, M and N, when constructed in what I understood was to be the corrected or amended form to be given to the drawing before filing in the Patent Office.

x-Q. 226. Now we come to the subject of whether the claims of the patent as issued are substantially identical with the claims of the original specification; for you have repeatedly stated of your own accord that those two sets of eight claims each are substantially identical. I do not think it was proper for you to make that statement because the question of identity or non-identity between those two sets of claims is a question for the Court, and because the Court, in deciding that question, will take into account not only the language of the two sets of claims, but also the language of the two specifications upon which those two sets of claims are respectively founded. To guard against the Court misconstruing my omission to fully explore this subject on cross-examination, I make this statement, and I will add that I do not intend to inquire of you whether the same words when they occur in the claims of the patent as granted, have the same meaning that the same words had in the claims of the original specification. But I will point out to you differences in language between the original claims and the claims of the patent as granted, and which differences of language alone operate to make those claims substantially different; and I will ask you whether I am not right in pointing out the differences of language, and also in detecting the resulting differences in the meaning of claims. For example, Claim 1 of the original specification called for "one or more nippers" on the rotating cylinder, and Claim 2 and Claim 3 and Claim 4 and Claim 7 also called for one or

more nippers on the rotating cylinder. But Claims 1, 2, 3, 4 and 7 of the patent as granted omit to call for any such nippers, those words having been cancelled also in red ink when you amended the purple specification after the original drawing had been changed from the condition of the first blue print to the condition of the second blue print. At the same time that you cancelled those words in those claims, you inserted in each of those claims except Claim 7 the following new language, "means to move the bag tube with the cylinder." Now, this new language was broad enough to cover not only "one or more nippers" on the cylinder, but also the totally different scheme of moving the bag tube with the cylinder which was newly introduced into the case in Figs. 9, 10, 11 and 12 of the drawings, and also in three paragraphs of new red ink description which afterwards became the paragraph of the patent which begins with line 127 of page 2 and ends with line 13 of page 3 of the patent. Thus in cancelling from Claims 1, 2, 3 and 4 of the original specification, the words "one or more nippers" and substituting therefor the words "means to move the bag tube of the cylinder," you undeniably made Claims 1, 2, 3 and 4 of the patent as granted much broader than the corresponding claims of the original specification. And in the case of original Claim 7, you cancelled the words "one or more nippers" and did not substitute any language whatever to refer to those nippers or to refer to any other means for moving the bag tube with the cylinder, and thus you broadened Claim 7 even more than you broadened Claims 1, 2, 3 and 4.

Now, having made this careful analysis of the matter, I ask you whether that analysis is not correct, and if so, whether you do not now see that Claims 1, 2, 3, 4 and 7 of the patent as granted are substantially different and substantially broader than the corresponding claims of the original specification?

[*Recess until 2 p. m.*]

AFTER RECESS.

A. Your so-called analysis as to what changes were made in the claims is correct, but your deductions and assumptions, while in a sense true, are different from the opinion which I hold upon the matter. In the first place, the only change which the substitution in Claims 1, 2, 3 and 4 made, was to remove the restriction that the bag tube shall be carried or moved with the cylinder by means of nippers, which nippers for such purposes are old and well known, and therefore should not be introduced into the claims in a restricted meaning. In making the change from "nippers" to "means to move the bag tube with the cylinder," I simply did what would have been done by an amendment even if Fig. 9 had not been introduced into the case, and therefore there was no change of invention, but simply a difference in the language employed to state the same invention. This change, therefore, I do not consider as in any sense changing the claims as the language in the claims as they now appear would apply to the structures without Figs. 9, 10, 11 and 12 and as the case originally stood before these were added. For these reasons, I am of the opinion that Claims 1, 2, 3 and 4 of the patent as granted are not substantially different than the corresponding claims of the original specification, though they are slightly broader in that the restriction to a nipper for moving the bag is removed. It does not follow, however, that under a proper legal construction of the claims as they were originally drawn, with the nippers, that a Court would hold that nippers being such common and well known devices in the art, any other device which would answer its purpose would be included as a mechanical equivalent, since the real invention sought to be covered by the claims does not reside in the nippers or the means to move the bag tube with the cylinder. The seventh claim which merely omitted the nippers was somewhat broadened in actual language, but, as some means would be necessary to cause the bag tube to travel with the cylinder and would therefore be understood in the organized machine called for by Claim 7, I am not prepared to say that there is any substantial difference between Claim 7 as it now stands and as it was originally drawn.

x-Q. 227. Now, Mr. Hunter, I am going to call your attention to an important contradiction in your testimony, and ask you to state which of the two contradictory statements is true. At one place in your answer to Q. 4, and not far from the middle of that answer, in speaking of the original draft of the specification without the red ink amendments and of the time when you sent them to Mr. Haverstick prior to January 7th, 1896, you said: "I requested Mr. Haverstick to have Mr. Liddell execute the application in the form I sent it"; but in your reply to x-Q. 94 you said, "When sending the rough draft to Mr. Haverstick, it was quite evident that some corrections would have to be made, and I expected Mr. Liddell to make those corrections when executing the same." Now, please to state whether the first of these statements or the second of these statements is to be treated as your final testimony upon the point?

A. You are laboring under a misapprehension as to the meaning of the first quotation. The point I intended to make in my answer to Q. 4 was that I knew that the application was not incomplete form, and that, knowing that it required additional explanation or amendment, which alone could be made by Liddell, I sent the application in its imperfect form, but fully describing the broad idea of Mr. Liddell's invention with the object of getting it executed in some form, either just as I sent it or, if Mr. Haverstick could get the additions or amendments made by Liddell, then with those additions incorporated. In my answer to x-Q. 94 I stated that it was quite evident that some correction would have to be made, and I expected Liddell to make those corrections when executing the case. I, however, could not be certain that he would make them, as I had no control over him whatever. I desired him to make them and expected him to make them, and notwithstanding this I sent the case to Mr. Haverstick in the form it was, requesting Mr. Haverstick to have Liddell execute the application. In my answer to Q. 4, I spoke of the matter in a general sense, and did not wish to be understood that I would exclude from the original draft of specification the very corrections which I was so desirous of having made. There is no contradiction whatever, as I look at my testimony.

16 x-Q. 228. Your last answer misses the point of the contradiction. That contradiction consists in the fact that in your direct-examination you testified that you requested Mr. Haverstick to have Mr. Liddell execute the application in the form in which you sent that application; whereas, in reply to x-Q. 91 upon the same subject you testified that you expected Mr. Liddell to make some corrections in the application when executing the case. Now, the question is, whether you did or did not request or expect Mr. Liddell to execute that application in the form in which you sent it to Mr. Haverstick, and which form, as you have elaborately shown, consisted in the first purple draft of the specification with the pencil amendments and without the red ink amendments, and which purple draft
17 referred to the original drawing as that drawing existed at that time, and which condition is shown by the second blue print, as that blue print was originally made photographically from the original drawing?

A. My previous answer was an exact answer to the previous question, and is an exact answer to the present question. I did not miss the point at all, and fully understood what you referred to. The error that you make is that you use the word "form" from my answer to Q. 4 as meaning the exact language of the specification, whereas it is a reference to the general condition of the case, that is, in its unfinished form. The particular language used in describing the invention was of no consequence to me, whatever, so long as it explained the real
18 invention, but I realized that the application was not in proper form because we lacked some of the necessary information which Liddell alone could supply. With this understanding, there is no contradiction whatever between my statements.

x-Q. 229. Still further along in your answer to Q. 4, you say, "On January 7th, 1896, Mr. Liddell came to my office and went over his cases with me, and decided upon all points, and the papers were completed, and he executed them while he was in Philadelphia." Now, please to state in detail everything that Mr. Liddell said everything that he did in your office on January 7th, 1896, relevant to the proposed application for the patent which you designated at that time as Liddell Case

A, and which you have spoken of as being the application upon which the Liddell 558969 of April 28, 1896, was afterward granted? Of course, I do not inquire for a *verbatim* repetition of all that Mr. Liddell said, nor a kinetescopic reproduction of all that he did; on the other hand, I am not asking for a statement of your opinion of the legal significance of what he did, but I do inquire for an account of what he did with as much correctness and detail as you can furnish it, and without any expression of opinion from you as to the legal significance of what he did?

A. I have fully answered this question in my previous testimony, but to reply to the present question will say that he went over the case with me, I pointing out to him the discrepancies and information lacking, and he decided what changes to make, and under his instructions I made those changes, both in the drawings and description. The drawing, as before stated, was delivered to Mr. Drury after I had pencilled it. After the specification was copied, it was given to Mr. Liddell to read, which I presume he did, and it was then executed by him before the Notary.

x-Q. 230. Did you on that day read any specification or any portion of any specification to Mr. Liddell?

A. That I cannot say. I certainly did not read the copied specification, and there was no occasion for me reading the original draft because he had seen that.

x-Q. 231. How do you know that he had ever read the original draft of the specification, or ever did read it at any time in his life?

A. I do not know that he did, and it does not concern me whether he did or did not, as that was a matter which concerned himself. He was given the specification with the object of having him read it, and I can only presume that as an inventor he did read it.

x-Q. 232. How do you know that he was ever given that original specification for any purpose?

A. He came to the office with it, and he knew of its existence, and I can only presume that he read it.

x-Q. 233. You have no knowledge whatever, have you, that

92 Mr. Liddell ever read the original specification, or ever heard it read? Please answer this question upon the basis of your knowledge, and don't trouble yourself to state what you presume or what you infer or what you suppose, or to state anything except your knowledge?

A. I do not recall of its being specifically read to him, and of course I cannot tell, even if he were looking at it, if he was reading it or was not reading it; therefore, I cannot of my own knowledge say that he read it.

x-Q. 234. Have you any knowledge whatever that Mr. Liddell ever read or heard read any copy of the original specification as amended, or ever read or heard read the eleven sheets of typewritten description and claims which you sent to the Patent Office on or about January 27th, 1896, between the two
93 leaves of the Liddell folder, and which folder he did sign on January 7th, 1896?

A. He was given them to read and had them in his hand before executing the case, but whether he read them, or in a perfunctory way pretended to read them, I do not know.

x-Q. 235. It is true, is it not, that on January 7th, 1896, you did not read any specification to Mr. Liddell, or any portion of any specification, which had any connection with the Liddell application Case A?

A. I did not say that; I simply said that I did not recall reading the specification to him. I do not even recall reading any parts of the specification to him, because, after understanding what changes he wished me to incorporate, I included them
94 without having any difficulty to describe them, and therefore not anticipating anything being incorrect.

x-Q. 236. Was it your idea that it was unnecessary for Mr. Liddell to understand the specification and claims in their entirety, and was sufficient if when completed by you those claims and that specification constituted a coherent representation of a paper bag machine?

A. No; I consider an inventor should understand the specification, but I do not consider that it is necessary for him to understand the claims, because he may not be capable of understanding the scope of a claim. When I have done my work in

preparing a case, I take it for granted that the inventor has enough interest in his own invention to read the specification and satisfy himself that it is all right, and I presume that this was the condition of things with the application of Mr. Liddell.

x-Q. 237. It is true, is it not that you knew on January 7th, 1896, that Mr. Liddell had no pecuniary interest whatever in his application Case A, and would have no pecuniary interest in any patent granted thereon, and it is also true, is it not, that you understood it had been difficult to get Mr. Liddell to come to your office at all after October, 1895, to attend to the case; and it was apparent, was it not, to you on January 7th, 1896, when Mr. Liddell was in your office, that he cared nothing about the case one way or another, and was there simply to do whatever you wanted done about the case, and was in a hurry to get away?

A. I did know by the contract that Mr. Liddell would have no interest in the patent when issued, and I did know that it was difficult to get his attendance, but I did not know that he did not care anything about the case and was anxious to get away. The fact that he came over to Philadelphia to attend to that case refutes any such assumption, and I have no right to assume for a moment that an inventor who was going to swear to his invention does not care anything about it. I at least would assume that he is interested sufficiently to see that it is properly described.

x-Q. 238. It is proper for me to state to you that Mr. Liddell himself has given an elaborate deposition in this case on this subject, in which deposition he stated that he went from Brooklyn, New York, to Philadelphia, on January 7th, 1896, at the request of Mr. Haverstick and to accommodate him, and that he did not think that the machine of Case A would ever amount to anything anyhow; and that when he reached your office, some specification or other was handed to him as being the specification of that case, but that he was given no opportunity to read that specification with any care because there was so much other business going on in the office that he could not alone in that office, under the surrounding circumstances, read the specification and compare it with the drawings so as to understand the

two; and that he did not read any specification at all in your office that day, but simply assumed that you had prepared the specification and drawings to conform to the invention which he had explained to Mr. Drury, and that he made the signatures and took the oath which he did make and did take in good faith reliance upon your having prepared the drawings and specifications in conformity to his directions to Mr. Drury, and without knowing, as a matter of fact, whether those drawings and that specification, conformed or did not conform to the sketches and explanations he had given to you and to the draftsman Drury. Now, please to state whether you know anything contradictory to Mr. Liddell's testimony on this subject as that testimony is summarized in this question?

A. I have stated the facts in my deposition, and where these facts differ from Mr. Liddell's statements they are things which are contradictory to his statements, if you have summarized them correctly.

x-Q. 239. I have thus far found it impossible to acquire from your testimony any clear idea of what Mr. Liddell said or did in your office relevant to his Case A on January 7th, 1896, aside from his writing his name at three places on the folder and taking the oath on the folder; whereas Mr. Liddell's statements in his deposition as to what he did and said on that occasion are perfectly clear, it is so important in this case for the Court to learn exactly what he did and said about Case A in your office on that day, that I must hammer away still longer at this cross-examination with the hope of sooner or later getting some precise statements from you on that subject. It is useless for you to repeat your observation that he "went over his cases with you," and it is useless for you to employ any other ambiguous language which may mean much or may mean little or may mean nothing. Please now come down out of the clouds and tell precisely what Mr. Liddell did and what he said about his application Case A in your office on January 7th, 1896?

A. I have explained what took place about as fully and completely as it can be done. I did not make any memoranda of his particular language or our particular discussion beyond incorporating the substance of them in the amendments which

were made to the case, and I do not intend to attempt to say just what words he used. There can be no misunderstanding as to what I have testified to and what it means. It is very plainly said, and there is no soaring in the clouds, as you call it. This matter has arisen after seven years have elapsed, and as I have given no thought to this patent from the time it was taken out until the present time, there was nothing to impress upon my mind or to retain upon it any particular words which might have been used by Mr. Liddell on January 7th, 1896. The patent as it issued embodied in its construction, description and claims, the invention which Mr. Liddell disclosed to me and which he wished me to patent as his invention, and I simply went through the necessary work to accomplish his wishes in the matter, just as I would do it in any case. The annoyances which I was put to to get the case straight, and the fact that it and Case B were the only two paper bag machine cases that I recall attending to over a great period of time, makes the circumstances surrounding the case more clear to my mind at this time than would have occurred if these peculiar conditions had not existed, but I do not profess to recollect exact words of conversations. The records are evidence sufficient to show what the conversations referred to and consisted of, even though the particular words may not be remembered.

X-Q. 240. Nobody is asking you or has asked you for any particular words, and the record does not show what the conversation consisted of, as you must very well know. I much regret that you omit to answer my questions fairly and responsively, and that the cross-examination must be much prolonged by that cause. However, I continue by asking more questions. You say in your last answer, "I have given no thought to this patent from the time it was taken out until the present time." Now, Mr. Hunter, is it not true that you were informed last January or February, and nearly or quite six months ago, that Mr. Liddell had testified in an affidavit that he never invented the corelating mechanism of the Liddell patent 558969, which consists of the cam K', the cam K, the rod *k*, the link *k*2 and the arm connecting that link with the gear M1; and that that corelating mechanism never was known to him at all until after

the patent was issued in April, 1896, and that he inferred that it must have been contrived either by you or your draftsman, Mr. Drury, and inserted in the application for the patent without his knowledge; and is it not true that you were thereupon interviewed by counsel for complainant in this case with a view to learn what reply you could make to that testimony of Mr. Liddell, and is it not true that soon afterward, namely, on March 16th, 1903, you came from Philadelphia to my office in New York and attended there nearly a whole day while William Liddell was giving a deposition to the same effect of his affidavit; and is it not true that during the last six months you have spent several weeks of time in preparing to give your present deposition with the hope of making more or less of a reply to the testimony of Mr. Liddell relevant to the origin of that corelating mechanism of the Liddell patent which he says he never contrived and never heard of or knew of until after that patent was issued?

A. Your question contains many queries which I cannot answer categorically all at the same time. In the first place, I do not know just when the question of Liddell's application and the facts relative thereto were inquired about of me, but as it was some little time before I attended on the day you mention at your office in March, I presume that some time in February or January the matter was brought to my attention. The question of the filing of the application and the incidents connected therewith did not require any special consumption of time on my part, as most of the matters were matters of record, and the general circumstances were recollected by me, but considerable time was given in making the most diligent search for the purpose of finding the original drawings on manilla paper of Mr. Liddell, and nothing was left undone with an endeavor to find those drawings. I have given very little consideration to this case, and do not know what the controversy is about. I was asked simply to produce the files of my office and give testimony showing that the invention was filed in the Patent Office as the invention of Mr. Liddell, and this, I presumed, would occupy possibly a day's time. I have been on the stand for one week. From the time that I was in your office on March 16th,

up to the time I came over to New York last week to testify, I have given practically no attention or time to the case. There has been no occasion for me to do so. It is, therefore, not true that I have spent several weeks of time in preparing to give my present deposition. I have simply taken up the subject in a careful way, but without spending any more time than was absolutely necessary to get the facts together.

x-Q. 241. It is true, is it not, that you were shown about February 1st, 1903, a copy of the affidavit which Mr. Liddell had made near the end of January, 1903, setting forth his statement that he never invented the corelating mechanism of the Liddell patent 558969, which consists in the cams K and K', the rod *k*, the link *k*2 and the arm connecting that link with the gear M', and setting forth such facts as indicated that that corelating mechanism was contrived by you or by Mr. Drury and inserted in the Liddell application without his knowledge?

A. Such an affidavit was shown to me, but as the statements were absurd and were not the fact, it didn't require any special consideration on my part.

x-Q. 242. About how long before you came to my office on March 16th, 1903, was that affidavit shown to you?

A. I could not recall that; I have no recollection now just when, but suppose it was at least two weeks and probably more.

x-Q. 243. What was your motive in coming to my office on March 16th, 1903, and giving nearly or the whole of the day to hearing Mr. Liddell testify in this case?

A. Mr. Betts wanted to have the original files of my office in New York in case he might want to use them, but he did not wish them to be out of my possession or to be in his possession at all, and therefore thought it best that I should come over to New York and bring them along. I suppose that he might also have thought that some question might arise that he might have wanted to ask me about. I only stayed that day and took the files back.

x-Q. 244. But the files were not produced or used on that day or on any day when Mr. Liddell's testimony was taken, and they were not produced at all in this case until more than four months later, so that your bringing the files to Mr. Betts' office

and showing them to him and taking them back to Philadelphia the same day don't account for your coming to my office and spending nearly a whole day hearing Mr. Liddell testify in this case. Please, therefore, to give some plausible reason for your attendance at my office on March 16th, 1903?

A. You are mistaken in presuming that the files were not used on March 16th. It is true they were not put in evidence but they were consulted and reference made to them. My reasons stated in my last answer are all the reasons I can give. I was requested to come over and bring the files, and I came over, as I would on any business.

x-Q. 245. Did you, on March 16th, 1903, show to Mr. Samuel R. Betts all the papers now contained in Complainant's Exhibit Hunter File Case A, including the four blue prints and the purple typewritten specification, and particularly did you show him that blue print which has only Figure 1 upon it, and which we have named the first blue print?

A. He certainly saw all the papers, but as he had a full copy of them in his possession, it was not necessary for him to have them out in the room in which the testimony was being taken.

x-Q. 246. How long had he had a complete copy of Complainant's Exhibit Hunter File Case A when you brought that exhibit to New York on March 16th, 1903?

A. I do not know exactly; it was made in my office at the request of Mr. Chambers, but just what the date was I do not recall.

x-Q. 247. Was that complete copy made at least several days before March 16th, 1903?

A. I have nothing here to fix the date, and it would be useless for me to try to guess at it. A copy of the files was wished, and it was made in the ordinary course of business, but just the exact date I do not know.

x-Q. 248. Was that copy in the possession of Mr. Samuel R. Betts on March 16th, 1903?

A. It is my opinion it was, but I have no data here to positively fix it.

x-Q. 249. What was the use of your coming to New York to show Mr. Betts the original file on March 16th, in view of the

fact that he already had a complete copy of it, and in view of the fact that he was not taking testimony and had no right or occasion to introduce it in evidence on that day?

A. I have already stated why I came over. I suppose that Mr. Betts wished to have the original files present in case he should have reason to want to use them or any of the papers in them. I do not know what course may have been in his mind, and I do not know that he did not expect to have cross-examined Mr. Liddell and might have wanted the papers at that time. I simply brought them over at his request, and took them back with me in the afternoon.

x-Q. 250. It is true, is it not, as far as you know, that I never saw the Complainant's Exhibit Hunter File Case A, or any document therein, or any copy of any blue print therein, until Thursday, July 23rd, 1903, when you produced it during the delivery of your long answer to Q. 4 in this deposition?

A. I don't think you saw the original file of my office, but I know nothing about whether you saw a copy or not.

x-Q. 251. When after the Liddell affidavit on January, 1903, was shown to you, did you begin work ransacking your office for sketches, drawings, memoranda, book entries, copies of letters and what-not, at the request of Mr. Chambers or at the request of Mr. Betts, relevant to the application for the Liddell patene 558969 of April 28th, 1896?

A. I do not know when I examined the papers in my office with a view of ascertaining the necessary dates and facts relative to the Liddell application, but it was done, I suppose, some time after the Liddell affidavit was made to which you refer; the searches for the facts were made in a careful, business-like way.

x-Q. 252. How much time during the last six months and since the Liddell affidavit of January, 1903, have you personally occupied in searching through your office for drawings, sketches, blue prints, files, memoranda, copies and what-not, with a view to collecting material to throw light upon the history of the application for the Liddell patent 558969 of April 28th, 1896?

A. I do not know; I made personally a very careful and

diligent search with regard to the drawings throughout all my offices, and the file room, and I also made a most diligent search through the draftsman's two offices with the hope of discovering the original Liddell drawings on manilla paper, but could not find them. Aside from my search, I had some of my assistants also previously search for them, and when they could not find them, thinking that they might have overlooked them, I made a careful search myself. With regard to the ordinary papers, such as letters, accounts and memoranda of regular filing, I had my assistants search for those records and then confirmed their search by going over them.

x-Q. 253. State as approximately as you can the length of time that you personally gave to all the searching of which you speak?

A. I suppose that the time consumed by me at different times in connection with such searches would have amounted to, possibly, several days.

x-Q. 254. Estimate the number of days.

A. I would not attempt to do it, because I do not have here anything to fix it, and I am not guessing. I know there was considerable time put on it, because the application was made so far back, namely, seven years, that there was possibility of papers getting out of place and being overlooked.

x-Q. 255. Were those searches made last winter, or were they made last spring, or were they made this summer or were they made in all of the three seasons I specify?

A. They were made in connection with the present controversy, but just at the moment I could not say when the first of these searches was made nor when the last was made. If Mr. Chambers desired some particular point looked up, it would be attended to, so that all of the searches were not made at the same time.

x-Q. 256. It is true, is it not, that you came to New York on Tuesday, July 21st, 1903, and that at eleven o'clock on the morning of that day Mr. John A. Shields, the Examiner, and myself, walked into the private office of Mr. S. R. Betts to keep an appointment which we had made to attend the taking of testimony on behalf of the complainant at that time; and

that, Mr. Shields and myself found you there with Mr. Betts, and that thereupon Mr. Shields administered the oath to you for your deposition in this case, and that Mr. Betts thereupon told me that he was not yet ready to begin taking your deposition and would not be ready to begin until the following Thursday; and it is true, is it not, that thereupon the taking of the deposition was adjourned until the following Thursday, and Mr. Shields and myself went away together leaving you and Mr. S. R. Betts, together?

A. Yes, that is true.

x-Q. 257. Now, Mr. Hunter, at that time how much time had you spent in conversing with Mr. S. R. Betts about the subject of the deposition which you were expected to give and which you are now giving?

A. I only reached Mr. Betts' office a few minutes before you put in an appearance, and had hardly spoken about the case except that by some mistake my office files had not been brought over from Philadelphia with me when I came that morning, and he thought that I should return and get them. Prior to that time I do not think that I saw Mr. Betts but the one time at your office on March 16th. If he was in my office at Philadelphia, I do not specifically recall it, but at best it was possibly only for a few minutes at most.

x-Q. 258. How much time prior to July 21st, 1903, had you occupied conversing with Francis T. Chambers about this case and particularly about the history of the application for the Liddell patent 558969?

A. Not more than possibly three or four hours altogether, that I recall.

x-Q. 259. It is true, is it not, that when you began giving testimony in this case on July 23rd, 1903, you understood perfectly well that Mr. Betts wanted, through your deposition, to trace to the mind of William Liddell that corelating mechanism of the Liddell patent 558969 which consists of the cam K, the cam K', the rod *k*, the link *k*2 and the arm connecting that link with the gear M1, so as to contradict the testimony which Mr. Liddell had given that he never invented that corelating mechanism at all?

A. I suppose that that view might be taken of it, but I would rather say that he wished to place upon the record the exact and correct facts which surrounded the making of the application and the issuing of the patent to William Liddell.

Adjourned to Wednesday, July 29, 1903, at 10:30 A. M.

NEW YORK, July 29, 1903.

[*Met pursuant to adjournment.*]

Present: Counsel as before.

RUDOLPH M. HUNTER *resumes:*

[*Cross examination continued by* Mr. WALKER.]

x-Q. 260. Have you not known during the last five months that the issue in controversy in this case about which you are testifying is the question whether William Liddell invented that corelating mechanism of the Liddell patent 558969, which is indicated in the drawings of that patent as the cam K, the cam K′, the rod *k*, the link *k*2 and the arm connecting that link with the gear M1, and which corelating mechanism is covered in Claims 1, 2, 4 and 7 of the Liddell patent by the words "operating means for the forming plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder?"

A. I have known for approximately that period that such a question was an incident in this case, and grew out of the affidavit that you previously referred to, but I do not understand that it is the basis of what litigation is going on at the present time, although I do not know the circumstances of the litigation or its scope. I consider this question which you outline as simply an incident which has grown out of the litigation.

x-Q. 261. You have understood for the last five months, have you not, that I claim as attorney for the defendant that William Liddell did not invent that corelating mechanism, and that I also claim that that fact invalidates Claims 1, 2 and 7 of the Liddell patent 558969?

A. My knowledge on this subject does not extend beyond the time that I was informed of the affidavit of Mr. Liddell,

and while I do not know just when that was, we may assume that it is about five months, but I do not recall that I ever gave any consideration whatever to that question in connection with any claims in the patent; in fact, I did not know until giving my present testimony what were the claims involved in this controversy.

x-Q. 262. You have known for five months or more, have you not, that I claim that William Liddell did not invent the corelating mechanism specified in x-Q. 260, and that I claim that that fact constituted a defence to this suit?

A. I presumed that that was the assumption on your part, and no doubt I had that understanding for the period you mention, namely, about five months.

x-Q. 263. I now show you a printed copy of the defendant's evidence in chief in this case, and I call your attention to the affidavit of William Liddell printed on pages 763 to 770 inclusive of that printed record; and I ask you to state whether you recognize that as appearing to be substantially the same fifteen paragraphs of matter as corresponding paragraphs of matter in the copy which you saw about February, 1903, of an affidavit which William Liddell had made shortly before that?

A. That appears to be substantially the same as the affidavit that I saw at the time you mention.

x-Q. 264. I also call your attention to the deposition of William Liddell in this case, which occupies pages 527 to 763 inclusive of the printed record of the defendant's evidence in chief in this case, and ask you to state whether you have heretofore examined another printed copy of the same record and examined that printed deposition in that printed copy?

A. I never saw that testimony of Mr. Liddell until I was shown a copy when coming here to testify last Tuesday, July 21st, and I have never read that testimony beyond here and there referring to it to ascertain whether his ideas as to dates and general condition corresponded to my own recollection.

x-Q. 265. It is true, is it not, that you were present in my office throughout the time when William Liddell was giving that deposition, down as far as the answer to Q. 99, which answer was the last answer given on the first day of the deposition, namely, March 16th, 1903, and to refresh your recollection

on this point I call your attention to Q. 97 and to the objection which Mr. Betts interposed to that question, and to the statement which I put upon the record in response to that objection, and which statement reads as follows:

> "Mr. Walker states to the Court that he expects to prove hereafter that one of the complainant's attorneys now present in this room, is the man who was to blame for the affidavit which was filed by the witness in the Patent Office in connection with this application."

A. I was present, as before stated by me, as that is the time when I brought over the original files of my office at the request of Mr. Betts, but I was not in the same room all the time, and did not hear all the testimony that Mr. Liddell gave on that day, though I did hear a considerable portion of it.

x-Q. 266. It is true, is it not, that you were in the room when I inserted in the record the statement which I quote in x-Q. 265, and it is true, is it not, that you understood that statement to be intended by me to refer to you as being the man who was to blame for the affidavit which was filed by the witness in the patent in connection with the application?

A. Yes, I was present at that time, and no doubt fully understood the import of your statement on the record, and that it referred to me.

x-Q. 267. Have you examined any other part of the 835 pages of the printed defendant's record in chief in this case, aside from the affidavit of William Liddell and aside from the deposition of William Liddell?

A. No, I have not.

x-Q. 268. Now, for the convenience of the Court, I wish to place on record at this point something to indicate where in the specification of the Liddell patent 558969 the matter is to be found which originated in the two sheets of red-ink amendment which you wrote and which are among the papers in the Complainant's Exhibit Hunter File Case A. Please to first look at that one of those red-ink amendment sheets which is written on white paper, and state whether the first nine lines of that red-ink amendment are to be found reproduced in lines 58 to 66 inclusive of the first page of the specification in the following language:

"Fig. 9 is a diagram illustrating the employment of a continuous or connected series of tubes to insure their being fed with the cylinder and obviating the necessity of nippers. Fig. 10 is a plan view of the paper tube employed in connection with Fig. 9. Fig. 11 is an inverted plan view of same, and Fig. 12 is a longitudinal section of the tube on line *zz*."

A. That is correct.

x-Q. 269. Now, please to look at all the rest of the red-ink matter on the white sheet, and state whether that matter is not identical with that paragraph of the specification of the patent which begins with line 98 of page 1, and ends with line 13 of page 2 of the specification, except that the shaft which is designated by the letter J in the red amendment is designated by the letter L in the patent?

A. That is correct.

x-Q. 270. Now, please to state whether all the matter on the buff amendment in red ink writing is not identical with that paragraph of the specification which begins with line 128 of page 2 and ends with line 13 of page 3?

A. That is correct.

x-Q. 271. Now, Mr. Hunter, please to state whether you have any knowledge that either or both of those two red-ink amendments were ever read to William Liddell from the sheets of paper upon which they were written and now appear in Complainant's Exhibit Hunter File Case A, and also state whether you have any knowledge that the matter on those two sheets of paper was ever read by William Liddell on those sheets. I am not now asking whether the same language as it appeared on the eleven typewritten sheets which you sent to Washington on January 27th, 1896, was ever read to or by William Liddell; my question is confined to the original red-ink pen-written amendment, and I want to know whether you have any knowledge that those two sheets of paper were ever read by William Liddell or were ever read to William Liddell. This is an important point, and I desire that you shall not base your answer upon any presumption or inference, or any pious or impious wish, but only upon your own personal knowledge.

A. I do not recollect whether they were read to him, neither do I recolect that they were read by him.

x-Q. 272. Now, Mr. Hunter, carry your mind back to January 3d, 1896, and state whether, when you sent the original draft of the specification to Mr. Haverstick, it was not apparent to you that the original drawing required to be amended by inserting therein one cam to rock the arm F, and by inserting therein another cam to oscillate the plate E upon the end of the rocking arm F, in order to produce "operating means for the forming plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of the said cylinder"?

A. I do not know what may have been in my mind at that time, but I did know that cam devices of some kind were understood and intended by Mr. Liddell, but I did not attempt to presume the introduction of those devices as additional elements without the sanction of Mr. Liddell or under his direction, and therefore the specification was drawn upon the structure as I found it in the original drawing. In some parts of the specification, it speaks of the forming plate as oscillating, while in some places as rotating; for instance, in the latter case, on page 5, it is stated "As the cylinder C moves forward, the plate E rotates upon its own axis *e* and also about edge W as an axis."

x-Q. 273. I call your attention to the following paragraph in the original specification:

> "E is a forming plate and is hinged at *e* to the arm F journaled to the main frame at *f*. This arm F is drawn toward the cylinder C by a spring F′ and is moved away from the cylinder about the axis *f* by gears K."

Now, I inquire if I am not right in understanding that you knew at that time that the gears K shown in the original drawing could not move the arm F away from the cylinder and allow that arm to be drawn back towards the cylinder by the spring F′; and that some cam would have to be added to the mechanism for the purpose of thus rocking the arm F, and that the gears K as shown in the original drawing were wholly unable to perform that rocking function or any part of that function? And am I also right in understanding that when you sent the original specification to Mr. Haverstick, you made

a pencil interrogation mark in the margin of that paragraph for the purpose of calling the attention of Mr. Liddell to the fact that the gears K could not perform the function ascribed to them in the specification, and that some change in the mechanism would have to be made in order to perform that function at all?

A. You are right in your last assumption regarding the interrogation mark and its purpose. With regard to the other query, I will say that I must have known, and no doubt did know that the cam gears as shown would not properly operate the arm F, but I did not know but that the draftsman had placed these gears on the drawing incorrectly, and that what he should have made in their place was a cam corresponding to the gear on the shaft L and an extension of the arm F from the shaft *f* to be operated upon by that cam. There is no doubt that some such idea as this was in my mind when drawing the original specification, because I very clearly defined the movement which was to be produced in the arm F by the action of these cam gears or the assumed parts which were to take their place. I have no recollection of directly connecting the use of the eccentric gears with the gears M', M, M, N, in connection with the plate E, because to do that would have assumed that something was absolutely missing, instead of being incorrectly shown.

x-Q. 274. I call your attention to the fact that the original specification contained the following language:

> "Spur gears M', M, N, operate the axis *e* of the forming plate E;"

and that the original typewritten specification contains no other statement of means of either oscillating or rocking the forming plate E upon the end of the arm F. And I also call your attention to the fact that this deficiency is supplied to some extent by the pencil amendment to the original specification, and which pencil amendment consists in adding to the language last quoted the following:

> "when the arm F is moved. Of these gears, M' is fixed, and hence when the arm F is moved, the gears M work upon the gear M' as if it were a rack. This causes motion to the plate E about *e* as an axis."

Now, I ask you whether at the time when you made that pencil amendment you did not understand that the gear M′ was to be absolutely fixed and was not to receive motion from any source whatever, but was only to act as a stationary rack to cause the gears M, M and N to turn when those gears would be raised and lowered with the arm F upon which they were mounted.

A. That is substantially correct, as I found nothing else in the drawing to base that theory on after assuming that the cam or eccentric gears were intended to be used to operate the arm F. But I also knew that the motion would not be strictly correct to cause the plate E to move as it should move, and I therefore placed another interrogation mark opposite this description, and also made a memorandum calling attention to this condition.

x-Q. 275. Now, you knew, did you not, on January 3d, 1896, that the gear M′ must be rocked somewhat for the purpose of modifying the rack action between its periphery and the gear M, in order that the plate E might oscillate harmoniously with the cylinder C?

A. I do not know what I knew or thought I knew at that time, beyond the fact that I did know that the construction such as was shown was defective and needed some change in it of some kind.

x-Q. 276. Now, you have testified that on January 7th, 1896, you first placed in pencil upon the first blue print a cam to rock somewhat the gear M′, and that that cam is represented now upon the face of the first blue print by a pencil mark which you placed there then around the shaft *f*; and you have testified that, on second thought you transferred that cam from the shaft *f* to the shaft L, where it appears in the second blue print to be indicated by the letter K, and which cam appears to be indicated by the letter K in Fig. 1 of the drawings of the patent, and you have also testified that on the same day you described that scheme for rocking the gear M′ by writing the following language in that red-ink amendment which you wrote on a white sheet of paper, namely:

> "As the motion of the arm F is irregular and not always in the same direction for one continuous movement of the former plate E, I cause the gear M′ to be

moved somewhat to compensate for this. On the shaft J I arrange the cam K which acts upon a rod *k* to reciprocate it, and this by link *k*2 rocks the gear or rack M1."

And you have also testified that this language thus written by you in red ink to describe that scheme and mechanism for rocking the gear M′ is the same as the language of the patent in the paragraph which begins with line 98, page 1, except that the patent rightly designates the shaft referred to in the language by the letter L, instead of by the letter J; there being no shaft J in the drawings of the patent, and the context plainly showing that "the shaft L" was meant where you wrote "the shaft J" in the red pen-written amendment. Now, having called your attention to these already established points, I ask you to state when and how you first acquired the idea of causing the gear M′ to rock by means of the cam K, the rod *k* and the link *k*2, and also when you first acquired the idea of mounting the cam K upon the shaft *f* and also when you first acquired the idea of shifting the cam K from the shaft *f* to the shaft L?

A. All of these ideas and changes occurred at the time of the interview with Mr. Liddell on January 7th, 1896. The particular drawing of the cam on shaft *f* in pencil on the first blue print was no doubt at some stage of the discussion, but I suppose there not being sufficient movement to the shaft *f* by the rocking of the arm F to give enough movement to the cam, it was decided to put it on the shaft L together with a cam M to operate the arm F directly. These changes eliminated the eccentric or cam gear, and I suppose for that reason they were erased.

x-Q. 277. Now, the question is, whose mind it was that originated on January 7th, 1896, that mechanism consisting of the cam K upon the shaft L and of the rod *k* and the link *k*2 and the arm connecting that link with the gear M′ so that the continuous revolution of the cam K would cause the gear M′ to rock somewhat, instead of being fixed as it was said to be in the original specification. Mr. Liddell has testified at great length through a direct-examination and cross-examination amounting to 70,000 words, that he never contrived that mechan-

ism at all, but that the mechanism he contrived for moving the gear M1 was two eccentric gears which were elaborately described by him in his deposition, and which, as it now turns out, are substantially the same as the two eccentric gears shown in the first blue print. Under these circumstances I ask you to be very careful and conscientious in answering the following question: Did not you originate that mechanism consisting of the cam K upon the shaft L and the rod *k* and the link *k*2 and the arm connecting that link with the gear M′, and did you not on January 7th, 1896, suggest that mechanism to Mr. Liddell as proper to be used in his machine to rock the gear M′, and did you not with your hand represent that cam K in pencil upon the first blue print in Mr. Liddell's presence to show him the idea, and is not that explanation which was made to Mr. Liddell traceable in the fact that you made the first pencil sketch which ever was made (as far as your testimony shows) anywhere to represent that scheme, and which pencil sketch still exists upon the face of the first blue print?

A. I think that there is no doubt but that the pencil marks on Fig. 1 of the original blue print were made by me, but anything I did in connection with the change of this drawing was done merely as a tool for Mr. Liddell. My endeavor was simply to incorporate such idea as he suggested should be incorporated, and I maintain that what was done was simply embodying into the application the ideas and inventions of Mr. Liddell. I had no interest whatever in inventing or trying to invent anything in that case.

[*Answer objected to as irresponsive and argumentative, and as volunteering improper matter not called for by the question.*]

[*Recess until 2 p. m.*]

After Recess.

x-Q. 278. Your answer is irresponsive to the question whether you originated the mechanism referred to. The only language in your answer that approaches responsiveness to that question is your statement that what you did in connection with

the change in the drawing was done merely as a tool for Mr. Liddell, but that statement is not responsive because it is confined to the drawing and does not include the originating of the mechanism and also because it is a metaphorical statement, and because that metophorical statement is not susceptible of precise translation into direct statement. We are not here to deal in metaphors, and you are not here to express your opinion on the legal effect of facts or to "maintain" any particular conclusion or proposition of law, and it is a pity that you seem unable or unwilling to answer simple questions of fact simply and directly. However, I must do the best I can with you, and therefore I inquire whether you did not originate that mechanism consisting of the cam K upon the shaft L, and the rod *k* and the link k2, and the arm connecting that link with the gear M', which mechanism is shown in Fig. 1 of the Liddell patent, and is described in line 102 of page 1, and lines 1, 2 and 3 of page 2 of that patent?

A. I did not originate it, and had no motive for originating it. It was not originated or designed before Mr. Liddell came to Philadelphia for the purpose of providing the information relative to this mechanism, and it was originated when he was there for that purpose, and it was furthermore introduced into the case to conform to his wishes and desires. I was merely an instrument to carry out his wishes in the matter, and in that capacity simply assisted him in my professional capacty.

[*Defendant's counsel objects to the whole of the last answer except the first five words, as being entirely uncalled for by the question and as introducing collateral statements, partly argumentative and partly metaphorical, none of which the witness had any right to make; but which, being made voluntarily by the witness in spite of being warned not to make such statements, will necessitate a considerable addition to the cross-examination.*

x-Q. 279. Are you willing, Mr. Hunter, to answer the questions I put to you responsively and without volunteering collateral instances and arguments, and to leave the argument of the case to counsel for complainant on the facts; or must I sit

here this hot summer, day after day, while you insert in the record arguments which you hope will help the complainant but which are outside of your proper function to make?

A. I have endeavored to answer every question clearly and intelligently so that the true facts can be understood, and so that my testimony cannot be read in a wrong light and made to mean something different than what I intended it to mean. This condition arises largely out of the fact that your questions are so involved and so needlessly long and contain so many inquiries in the same question, that it is almost impossible to make any answer that would be a brief answer to the question. Furthermore, your questions have been very largely personal attacks upon myself, with an avowed purpose of disbelief in what I have testified to, and continually attribute ulterior motives to my presence here as a witness, and I feel that under those conditions that I am justified in taking every precaution that you shall have the facts on the record, but stated in such a manner that you cannot possibly misrepresent them later on. I do not know the complainants, and they are not my clients, and I have no interest except to tell the plain facts and to properly protect myself against misrepresentation under the guise of cross-examination. I am perfectly willing to answer any question you put, and answer it with yes and no if the question is properly restricted and capable of being answered in that manner, but in all my experience I never saw such a series of involved questions put to a witness, and especially not when they are supposed to relate to questions of fact and not of opinion.

x-Q. 280. x-Q. 278 asked you whether you originated certain mechanism therein specified, and asked you no other question whatever. That question could have been answered in the affirmative or it could have been answered in the negative. You did answer it in the negative by the use of the first five words of your reply. But instead of stopping there, as you ought to have done, you added eighty more words of inference and argument and statement on other matters, which eighty additional words I must now cross-examine you upon, and I fear that that cross-examination will lead you into so much additional argument, inference and observation, that it

will be many hours before we can pass on. To begin with, your first volunteered statement was that you had no motive for originating the mechanism in question. Now, did not such a motive consist in the fact that you wanted to get through with that troublesome application of Case A, and get it off your hands, and in the fact that, though you had been trying for more than two months to get Mr. Liddell to put the invention into operative shape, he had not done so, and in the fact that with your uncommonly rapid inventive mind you could do in half an hour what Liddell had thus far failed to do at all to make that paper bag machine possibly operative?

A. No, it did not constitute a motive, because if it had been a motive I would not have waited for Liddell to come to Philadelphia to determine a mere mechanical movement.

x-Q. 281. Do you think that the substitution on January 7th, 1896, of the cam K, the rod *k*, the link *k*2, and the arm connecting that link with the gear M1, for the two eccentric gears K of the first blue print, was the mere substitution of one mechanical movement for another, which did not require invention to make, but was done by you legitimately as professional assistant to Mr. Liddell?

A. This is a good example of the class of questions that I have criticised, and why I cannot answer the question offhand or categorically. For example, this question makes an assumption that I have stated that the insertion of those particular devices recited comprising the parts K, *k*, *k*2, were substituted for the eccentric gears. I have never made any such statement. The original specification shows that the eccentric or cam gears were described by me as operating the arm F, and had no connection directly with the gear M′ to operate the former plate. However, to endeavor to answer the question, or its intent, I will say that, in my opinion, the additions or changes which were made were mere mechanical equivalents of such devices as were originally contemplated by Liddell, as shown by his affidavit to which reference has been made, because there is no claim in the case specifically directed to any special mechanical movement for imparting the oscillation to the forming plate during the act of forming the bottom of the bag, and further, there is no specific claim made to any mech-

anism designed to return the former plate to its original or initial position to receive the new bag tube. In my opinion, as the case was originally prepared and as the patent was issued, it was so drawn as to include any mechanical movements which might be adapted for the same purpose, and I therefore am of the opinion that the substitution of these devices recited in the question, while involving changes to the eye, are simply mechanical equivalents of the devices which it is alleged that Mr. Liddell originally invented.

[*The entire answer is objected to as irresponsive and argumentative, as will appear to whoever analyzes it in connection with the question.*]

x-Q. 282. Do you think that the insertion on January 7th, 1896, of the cam K, the rod *k*, the link *k*2 and the arm connecting that link with the gear M′, into the Liddell application for the purpose of somewhat rocking the gear M′ (which scheme you say in your answer to x-Q. 278 was originated in Philadelphia on January 7th, 1896), constituted an invention when it was thus originated and inserted?

A. That is a legal question which is hardly in my province. It took some thought, of course, but at best it was simply a mechanical movement to produce in the parts constituting the real invention of the machine the movements required, and while thus making up a part of an organized machine, it could be substituted by numerous other mechanical movements without in the least changing or modifying the real or intended operation of the machine. All this could be done without changing the invention as claimed, and for this reason I look upon those parts as mere mechanical features which do not go to the essence of the invention, though technically they might be considered patentable if it was attempted to claim them. You could not make a change in the other essential parts of the machine without destroying the invention, and therefore I do not believe that the real invention sought to be covered or claimed by Liddell in the application as prepared resided in these mere mechanical features.

[*The whole of the answer is objected to (except the first sentence thereof) as foreign to the question, argumentative, ambiguous, and as an attempt to give undeserved credit to the other parts of the machine, without being inquired of relevant to those other parts.*]

x-Q. 283. You have stated that the cam K, the rod *k*, the link *k*2 and the arm connecting that link with the gear M′, originated in your office in Philadelphia, January 7th, 1896, and you have stated that you did not originate that mechanism. Now, you are an inventor and also a mechanic, and presumably know the difference between invention on the one hand and mechanical skill on the other. Please, therefore, to state whether the originating of that mechanism in your office January 7th, 1896, constituted in your judgment an instance of invention on the one hand, or whether, on the other hand, it constituted an instance of mechanical skill without invention?

[*Complainant's counsel objects, on the ground that the opinion of the witness is immaterial on this subject.*]

A. The line between invention and mechanical skill is a very fine one in many instances. Where an invention resides in certain main parts of a machine, and where the connecting parts are mere mechanical movements which could be devised by any ordinary skilled mechanic, I should view those mechanical movements or changes in them in adapting them to their subservient use in connecting the main or essential parts of the invention or assisting them in performing their functions, as mere evidences of mechanical skill, and for this reason it is my opinion that the mere devices themselves which were introduced into the Liddell application on January 7th, 1896, should be considered as mere evidences of mechanical skill. This does not, however, preclude the possibility of them being considered material elements when taking the machine as a whole, because every part of the machine under those conditions is material, even to the framing of the machine itself which holds the several parts in their proper corelation. It is also possible that the Patent Office might have allowed some specific claim in which these particular devices were made elements, but such a claim would necessarily have had to include the essential parts of the

invention as well, and which essential parts did not reside in the mere mechanical movements.

x-Q. 284. You have repeatedly volunteered statements that the essential parts of the paper bag machine of Liddell Case A were other than the mechanism defined in x-Q. 281 and x-Q. 282. I think those statements were all improper for you to make. But inasmuch as you have volunteered those statements over and over again, I ask you to point out specifically in Fig. 1 of the Liddell Patent 558969 all the parts of the machine shown in that figure which you referred to in your last answer as being "the essential parts of the invention."

A. I consider that the essential parts of the invention are those parts which directly operate upon the paper bag tube to open the end of it and form the proper folds, and they may be said to comprise the continuously rotating cylinder C, the forming plate E, the side-folding fingers G, and the side-forming fingers H.

x-Q. 285. Do you not know that all of the elements specified in your last answer are shown in paper bag machine patents long prior to 1896, which paper bag machine patents showed machines for doing exactly the same work which the machine of the Liddell patent 558969 purported to be able to do, and do you not know that all the novelty that was introduced into the art by the Liddell Patent 558969 consisted in the corelating mechanism which that patent shows for moving the plate E, and do you not know that the only element of novelty in Claim 1, Claim 2 or Claim 7 in 1895 or 1896 was that very element of "operating means for the forming plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder," the principal part of which operating means is the cam K and the rod *k* and the link *k*2 and the arm connecting that link with the gear M'?

A. I consider your question involved again, but will endeavor to answer it by saying that I am not considering any special language in the claims as a recital in words of the invention, but am considering the operative parts of the machine itself, since these might be described or claimed in a variety of ways very differently worded from the claims of the patent,

and yet be designed to cover the same invention. I consider that the forming plate involves in that term the special movements called for by the description, and it is immaterial how those movements may be secured; consequently I consider the invention to reside in the forming plate having the forming fingers and adapted to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder to be the essence of the invention, and it is for this reason that I expressed myself in the last answer as I did. Your present question is restricted by the words used in the claim, and I consider that improper when analyzing the real invention of the structure, because it frequently happens that unimportant elements and connecting means are necessarily included in the wording of claims to define an organized machine and to conform to the technical requirements of the Patent Office. I still maintain that the real invention lies in the parts I have enumerated, irrespective of the particular mechanical movements which may be resorted to, to secure the desired movement of the plate.

[*The whole of the answer is objected to as irresponsive.*]

x-Q. 286. I now return to your volunteered statements in reply to x-Q. 278, and I ask you to state how you know that Mr. Liddell came to Philadelphia on January 7, 1896, for the purpose of providing information relative to any mechanism for rocking the gear M′? In answering this question, please omit argument and inference, and confine yourself to what you know.

A. I have never said that he came to Philadelphia for the particular purpose of providing information relative to any mechanism for rocking the gear M′, but what I did say was that he came to Philadelphia for the purpose of giving me any and all information that I required, and for the purpose of completing and executing the application; and the mechanism for rocking the gear M′ was merely one of the things which he provided in connection with his visit.

x-Q. 287. Mr. Liddell testified at great length that he went to Philadelphia merely to execute the papers which you had already prepared, and that he did not go there for the purpose

of furnishing you any additional information. Now, I ask you how you know that Mr. Liddell went to Philadelphia on January 7th, 1896, for the purpose of giving you any further information about paper bag machines?

A. I know that he did because I required it, that he should give me that information, and secondly, if the information had not been required there would have been no necessity whatever for his coming over to Philadelphia; and I further know that from what he did when he came over, that he came for that purpose.

x-Q. 288. You testified in reply to x-Q. 278 that you did not originate the mechanisms consisting of the cam K upon the shaft L and the rod *k* and the link *k*2 and the arm connecting that link with the gear M', which mechanism is shown in Fig. 1 of the Liddell patent. Now, I am going to ask you a very important question which I desire you to answer directly, without argument, inference or loose talk of any kind. That question is this: Who did originate that mechanism?

A. That mechanism originated out of the statements made by Mr. Liddell himself, which is a visible illustration of his own ideas, and was designed in the application at his instance and to carry out the movements of the parts he desired.

[*Answer objected to as irresponsive and ambiguous.*]

x-Q. 289. Are you going to answer x-Q. 288 or not?

[*Objected to as fully answered, and the bulldozing form of the question is criticised as improper.*]

A. I think that I have fully answered your question, but as it seems almost hopeless to make any answer which is acceptable, I will supplement my answer to x-Q. 288 by saying that I meant by that answer that Mr. Liddell created the essence and substance of that mechanism.

[*Answer objected to as vague and evasive, ambiguous, argumentative and essentially meaningless.*]

x-Q. 290. Your last answer is irresponsive and useless because it is confined to your opinion of what the essence and substance of the mechanism in question is, and because other

parts of your deposition show that you think that the essence and substance of that mechanism consists in the function it was originated to produce. Now, there is no doubt that Mr. Liddell originated the mechanism shown in the first blue print, and he testified in his deposition that he intended that mechanism to perform the function of operating the plate E. For these reasons, your last answer amounts to no more than to say that Mr. Liddell originated some mechanism or other for working the plate E. What I want you to do is to testify now, without any more evasion, who it was that originated in your office on January 7th, 1896, the cam K, and the rod *k*, and the link *k*2 and the arm connecting that link with the gear M′, for the purpose of somewhat rocking the gear M′?

A. The meaning of my answers were that the invention as defined in the parts that you mention was the invention of Mr. Liddell, and the mere drawing them out on the paper as visible evidences of his invention was done by me under his instructions.

[*Answer objected to as evasive, ambiguous, and as containing collateral matter not called for by the question.*]

X-Q. 291. Your last answer is evasive because it speaks of "the invention as defined in the parts," and because I am not asking for the origin of some invention which you may think is defined in those parts, and which I might think not to be defined in those parts. I want to know who originated those very parts, regardless of what they defined or didn't define, and regardless of whether there was any invention in them or not, and I insist that you shall discontinue trifling with the Court and shall state the name of the man that originated the cam K and the rod *k* and the link *k*2 and the arm connecting that link with the gear M′ for the purpose of somewhat rocking the gear M′?

A. Any one of ordinary intelligence, I think, would understand from my last three answers that I wished it to be understood that Liddell created those parts; at least, I have no reason to believe that he did not. They were inserted in the case under his instructions and for his benefit, and I can only presume that they were of his invention, if they constitute anything

more than a mere mechanical movement involving mechanical skill only.

[*The entire answer is objected to as evasive.*]

x-Q. 292. A person of ordinary intelligence might put one construction upon the three answers of which you speak, and a person of superior intelligence would probably put a different construction upon those answers. Moreover, it is immaterial how you wished those answers to be understood, and I have not asked you how you wished them to be understood, and, as matter of fact, I don't believe you wanted them understood at all. Now, quit dodging, if you can, and tell the name of the man who originated cam K, and the rod *k*, and the link *k*2 and the arm connecting that link with the gear M′ for the purpose of somewhat rocking that gear, and which mechanism you testified in your answer to Q. 278, originated in your office in Philadelphia, January 7th, 1896?

A. I have repeatedly stated the name, and I again repeat that these parts, as evidence of the structure shown in the patent here involved, were originated by Liddell.

x-Q. 293. What do you mean by the words in your last answer, which read as follows: "As evidence of the structure shown in the patent here involved?"

A. I mean to identify them with that structure and not consider them as mere arbitrary elements having no connection with the paper bag machine disclosed in this patent.

x-Q. 294. Your last answer corroborates the opinion I formed from reading your answer to Q. 292, that that answer was intended by you to be evasive and ambiguous. I therefore repeat the simple question which I have put to you so many times, and which you have evaded every time I put it to you, namely, who originated the cam K, the rod *k*, the link *k*2, and the arm connecting that link with the gear M′ for the purpose of somewhat rocking that gear, and which cam, rod link and arm you testified in reply to x-Q. 278, originated in your office in Philadelphia, Pennsylvania, January 7th, 1896? Now, please answer this question by telling the name of the man, who originated that mechanism in your office on that day?

A. That mechanism as part of the paper bag machine disclosed in the patent 558969 was originated by Liddell.

x-Q. 295. Now you have finally answered that question after a long struggle between us, I next proceed to inquire what Liddell did or said, or both, in your office on that day that constituted his origination of that mechanism?

A. I do not recall the conversation, but I put on paper what I understood from his explanation was the structure which he desired to be illustrated, and I furthermore put description of that structure in writing.

x-Q. 296. Did you ask him on that day to make any sketch of any mechanism whatever?

A. That I cannot recall, and it would not have been at all necessary, as I could sketch anything that he would explain to me during a conversation.

[*All of the last answer except the first four words is objected to as volunteered and argumentative.*]

x-Q. 297. Did William Liddell on that day make in your office any sketch of any mechanism whatever?

A. I do not recall whether he did or did not.

x-Q. 298. Did you ask William Liddell on that day to write any words of description or otherwise on any paper whatever except to ask him to sign his name at three places upon the printed folder?

A. Certainly not, as there was no occasion whatever, as I know of, that he should write any description himself.

[*All the answer except the first two words is objected to as volunteered and argumentative.*]

x-Q. 299. Did William Liddell on that day, in your office, write anything whatever except his signature at three places upon the printed folder?

A. Not that I recall, for the reasons stated in my last answer.

[*All the last answer except the first four words is objected to as argumentative.*]

x-Q. 300. Now it appears that the cam K and the rod *k* and the link *k*2 and the arm connecting that link with the gear M′ for the purpose of somewhat rocking that gear, originated in your office January 7, 1896, and that you were the only person who made any sketch or drawing or any description of that mechanism on that day. But you state that the mechanism originated in the mind of William Liddell. Now, please to state how the character of that mechanism was transmitted from the mind of William Liddell to your mind, and in answering this question you need not attempt a verbatim report of what he said, but you should state in an analytic way the history of the transmission from his mind to yours of the construction and mode of operation of that mechanism? Now please to attempt to give some definite testimony on that point.

A. It was done orally, and in conjunction with the oral discussion I placed marks upon the first blue print, and later on the original drawings to indicate visibly the impressions and ideas which were imparted to me by Mr. Liddell as his wishes and desires in illustrating his invention. I do not recall conversations, and therefore will not attempt to state what was said.

x-Q. 301. Did you mark in pencil on the first blue print representations of all the information you obtained from Mr. Liddell relevant to the cam K, the rod *k*, the link *k*2, and the arm connection that link with the gear M′ for the purpose of somewhat rocking that gear?

A. No, the pencil marks on that blue print were first suggestions, and did not contemplate the changes made in the erasure of the eccentric gears and substitution of the cam and arm for moving the arm F, neither did it indicate the placing of the cam for operating the gear M′ upon the shaft L instead of the shaft *f*. The mere shifting of this cam, however, was a self-evident proposition after deciding upon the use of the cam.

x-Q. 302. When Mr. Liddell came in your office that day, and you began conferring with him about Case A, did you first call his attention to the necessity of new mechanism for rocking the arm F, or did you first call his attention to the necessity of new mechanism for the gear M′?

A. I don't think any distinction was made in connection with these parts; the whole matter was discussed as relating to the same subject.

x-Q. 303. It is true, is it not, that according to Fig. 1 of the Liddell Patent 558969 it is the cam K' that rocks the arm F, and it is true, is it not, that according to that patent it is the cam K that rocks the gear M', and it is true, is it not, that those two cams have no connection with each other except in being mounted on the same shaft L?

A. Yes, that is true.

x-Q. 304. It is true, is it not, that as you understood the first blue print, it contained no mechanism whatever for rocking the gear M', and contained no proper mechanism for rocking the arm F?

A. That is correct.

x-Q. 305. It is true, is it not, that when Mr. Liddell came to your office on January 7th, 1896, you knew that both those results required to be accomplished and to be accomplished properly by some means or other?

A. Yes, that is true.

x-Q. 306. It is also true, is it not, that it was you who provided the drawings and the description of the mechanism now shown in Fig. 1 of the Liddell patent 558969, for accomplishing those two results. This question does not involve any inquiry as to whether the conception of those mechanisms originated with you or originated with Mr. Liddell?

A. As I understand the question, it was I who did the drawing and wrote the description of that mechanism.

x-Q. 307. Now, you have stated that, though you drew and described that mechanism, it was William Liddell who originated it and taught you how to draw it and describe it, and that in drawing it and describing it you acted simply as his tool or instrument. That testimony is contradictory to the testimony that Mr. Liddell has given at great length, and it is important testimony. The question is whether Liddell is right about it, or whether you are right about it; to enable the Court to decide that question in the light of all that can be said relevant thereto, I ask you to state one after the other the steps of disclosure that Mr. Liddell made to you when he con-

veyed from his mind to your mind a knowledge of the construction and mode of operation of the cam K, the rod *k* and the link *k*2 and the arm connecting that link with the gear M′ for the purpose of rocking that gear?

A. I do not see how I can answer the present question any more fully that I answered your x-Q. 300 and 301. The best I can do is to refer to that answer or repeat it.

x-Q. 308. When you made upon the first blue print the pencil marks about an inch above the letter M′, did you make those pencil marks to indicate the cam for rocking the gear M′, or did you make those pencil marks to indicate the cam for rocking the arm F?

A. I think that those pencil marks were simply intended to illustrate the shape of the cam for rocking the gear M′, as the shape is somewhat blurred on the lines around the shaft *f*.

x-Q. 309. What did you intend to represent by those pencil lines on the first blue print which extend about an inch to the right from the pencil mark around the shaft *f*?

A. That was intended to represent the corresponding part of the mechanism shown in Fig. 1 of the patent and indicated by the letters *k*2, *k*, and immediately back of the letter M′.

x-Q. 310. It is true, is it not, that none of the pencil marks on the first blue print would be intelligible to Mr. Drury if you had sent them to him on January 7th, 1896, without any explanation of their meaning?

A. No, I don't think that he would have hardly understood them without some explanation.

x-Q. 311. It is true, is it not, that when you sent the Patent Office drawings to the Patent Office on January 27, 1896, one of the sheets of those drawings was deficient in not having any signature of any inventor or of any attorney of any inventor thereon, and all of the sheets are deficient in having the signature of only one witness thereon?

A. I do not know that this was the condition. I find a letter in the file in which the Patent Office referred to the drawings in this manner: "Your application for a patent will be taken up for examination in its order upon receipt of drawing signed and witnessed. Drawing on file will be returned for correction upon request," and in the first part of the letter it

refers to informal drawing. I therefore hardly feel justified in assuming that there was more than one sheet of drawings lacking signatures.

[*Adjourned to Thursday, July 30, 1903, at 10:30 A. M.*]

NEW YORK, July 30, 1903.

[*Met pursuant to adjournment.*]

Present: Counsel as before.

RUDOLPH M. HUNTER *resumes:*

[*Cross examination continued by* Mr. WALKER.]

x-Q. 312. Do you understand that a sole patent is invalidated by positive proof that the sole applicant therefor was not the sole inventor of the invention claimed therein?

[*Objected to as calling for an opinion on a question of law.*]

A. This question seems to me to be one which is purely a question of law and outside of my jurisdiction or province, but not wishing to avoid answering any question, I will say that, as I understand the question, it would be invalidated under the conditions of your question.

x-Q. 313. You have understood that point of law the same that you do now for many years, have you not?

A. Yes.

x-Q. 314. Now, suppose the Court should decide in this case that you were joint inventor with William Liddell of the invention claimed in the Liddell patent 558969, of April 28th, 1896; it would result, would it not, that you made a serious professional mistake in acting as Mr. Liddell's attorney in fact in applying for that patent in his name as sole inventor of that invention?

A. It would not, because if the Court made such a decision, it would not alter the facts, but would be an error of judgment. Furthermore, as the matter merely relates to a mechanical movement which is not specifically claimed, and in place of

94 which there are numerous mechanical equivalents, and the necessity for which mechanical movement I was not instrumental in creating, I am also of the opinion that even under the assumption of your question, as far as it would be relative to the matters here inquired of, there would also be an error of judgment on the part of the Court if it believed that I was instrumental in devising for Mr. Liddell the particular mechanical movement shown, and should decide that the patent was invalid.

[*All of this answer except the first sentence is objected to as having no relevancy to the question and as a gratuitous attempt to argue another branch of the case.*]

x-Q. 315. Now, suppose that you were joint inventor with
95 William Liddell of the invention claimed in the Liddell patent 558969, April 28th, 1896; it would result, would it not, that you made a serious professional mistake in acting as Mr. Liddell's attorney in fact in applying for that patent in his name as sole inventor of that invention?

[*Same objection.*]

A. Your question is ambiguous, as it does not define to what extent I am to be assumed as having invented a part of the invention disclosed and claimed in the patent.

x-Q. 316. Now, suppose that you were joint inventor with William Liddell of the invention claimed in the Liddell patent 558969, April 28th, 1896, to such an extent as to invalidate that
96 patent; it would result, would it not, that you made a serious professional mistake in acting as Mr. Liddell's attorney in fact in applying for that patent in his name as sole inventor of that invention?

[*Same objection.*]

A. As this question assumes that I would have had to have made such a material part of the invention that it did actually invalidate the patent, irrespective of any question of possible error of judgment in so deciding, but assuming that it was an undeniable and absolute fact that such a condition did exist, then I can only assume that the patent would be invalid, and

that I would have made a serious professional mistake, but no such conditions exist in this case.

x-Q. 317. Mr. Hunter, I am going to repeat x-Q. 316 till you answer it, or till you plainly say that you won't answer it. Please to answer that question exactly as it stands. It is a perfectly proper hypothetical question, and I demand that you shall answer it fairly and responsively, and without volunteering any statement that the hypothesis of the question is not true.

A. If I were joint inventor with William Liddell of the invention claimed in the Liddell patent 558969, April 28th, 1896, to such an extent as to invalidate that patent, to use the words of your question, I would have made a serious professional mistake in acting as Mr. Liddell's attorney in fact in applying for that patent in his name as sole inventor of that invention for the reasons stated in my answer to x-Q. 316. The whole matter is purely hypothetical, and is not, in my opinion, called for by anything in this case, but I wish to answer the question as it was put.

[*The last sentence of the answer is objected to as volunteered and impertinent argument in favor of the complainant in this case.*]

x-Q. 318. It is true, is it not, that you have a strong motive to do all you can to prevent the Court from deciding that you made that serious professional mistake?

A. I have no strong motive in the matter at all, as the Court would make a grave error in rendering any such judgment, and while it might effect in some manner the real controversy which may exist in this suit, it would not affect me in the slightest.

x-Q. 319. Would it not affect you to have the Court decide that you had made that serious professional mistake, and to have that decision published (as it would be) throughout the United States in the Federal Reporter, and thus become known to patent lawyers generally, and presumably operate to seriously damage your professional reputation?

A. I do not believe that it would, because it would only establish the fact that I took an interest in my client's work to aid

them as far as it was possible, and without any ulterior motives whatever. Any man is liable to make a mistake in anything, especially where it is merely a matter of judgment, and as the Court is liable to make the same mistake, I do not think under the conditions surrounding this case, where the inventor takes the witness stand against his assignees, public opinion would be against me in anything that I have done.

x-Q. 320. What arrangement has been made by you with anybody for compensation for your services in this case?

A. None whatever; there never has been a word defining what I shall charge. I simply give such time as I am called upon, and charge for the time consumed in the ordinary course of my business. I did not suppose that I would have been on the witness stand more than a few hours at most, and did not look upon the matter as one of any special import so far as compensation was concerned. My bills for services are passed upon by the complainant's counsel, as the complainants are not my clients.

x-Q. 321. Have you rendered any bill to anybody as yet for any services in this case?

A. Yes, for the time actually consumed in hunting for the Liddell drawings, and such time as was positively given to the case.

x-Q. 322. When was that bill rendered, and what was its amount?

A. I neither know the amount nor when it was rendered, as I do not keep the accounts at all. They are attended to by a clerk in my office. As near as I can recollect, however, an account was paid through Mr. Chambers a couple of weeks ago or so, and I do not think it amounted to over $150.

x-Q. 323. Your direct examination in this case occupied more than a day, and the cross-examination has occupied five days. Please to state how much you expect to charge the complainants or the complainants' counsel for giving this deposition, assuming that it is ended to-day, after seven days of time spent in giving it?

A. I have but one rate of charge excepting in the work of the General Electric Company, which is greater. My regular charge is $40 per day, and I do not charge more than that even

though I am detained here in New York and lose a very great portion of my time which would otherwise have been employed in my business in Philadelphia, as I invariably work from nine o'clock in the morning until eleven or twelve at night.

x-Q. 324. Do you expect to charge and collect $40 a day for the time occupied by you in giving this deposition?

A. I do, as I have no other charge. I recognize, of course, that I could have been subpœnaed and the attorneys forced to come to Philadelphia to take my deposition, but as that would have been more expensive, possibly, and at least far more troublesome to the complainants' attorneys than to have me come to New York, I presume that their idea was that the latter course would be the most satisfactory to them.

x-Q. 325. It is true, is it not, that you did charge and receive $40 a day for the time you spent in preparing to give this deposition, including the time you spent in your thorough searches for Liddell sketches or drawings?

A. That is true, so far as I personally gave time, but it is not true where I employed one of my assistants to make any search.

x-Q. 326. How much did you charge for the time of your assistant or assistants in making searches preparatory to giving your deposition in this case?

A. That I do not know, but it is usually intended to be an offset to what I pay them for other work going on ordinarily in the office, and corresponding to their salary.

x-Q. 327. In what year did you begin doing business in your own name as a solicitor of patents?

A. In 1874, but I had been closely identified in conducting patent business with patent attorneys from about 1871, and since 1872 for some time afterwards I also did a professional business in my own name in Patent Office work for attorneys, both in writing specifications and making drawings, and in examining and reporting on machines.

x-Q. 328. In what place and in what year were you born?

A. In New York City, I think in 1856. I went into patent business in 1871.

x-Q. 329. Have you been conducting the business of soliciting patents in your own name ever since 1874?

A. I have.

x-Q. 330. About how many patents have you solicited for others during that twenty-nine years in addition to the 259 which have been granted to you, and in addition to your own applications which are still pending in the Patent Office?

A. I haven't the slightest idea; they are certainly very great in numbers.

x-Q. 331. Would it be an approximate estimate to place the number at 3,000, which would be about two each week?

A. I do not care to make any approximation whatever, as I have no idea as to the numbers, and do not feel called upon to guess at it merely for the satisfaction of counsel.

x-Q. 332. I do not ask the question for my personal satisfaction, but because I deem it material enough to be admissible in evidence in this case. It is a pity that you assume the function of passing upon the admissibility of evidence, and attempt to withhold evidence from the knowledge of the Court as results of your decisions that the questions are inadmissible. Please, therefore, to state as approximately as is practicable the number of patents which you have solicited for others during the last twenty-nine years?

A. I have no way of approximating them, and I must decline to attempt to do it.

x-Q. 333. Among your other activities, you have engaged, have you not, quite extensively for a number of years in speculating in stocks on Wall street, and have, during the last two years, lost nearly a half million of dollars in such speculations?

[*Objected to as immaterial.*]

A. I have speculated, similar to most people, but I decline to discuss what those speculations were or the amounts involved.

x-Q. 334. My last question is admissible in evidence in this case, in my judgment, because it throws light upon the question whether you are such a scientist as you have claimed in this deposition to be, or whether, on the other hand, you are the Col. Mulberry Sellers of the present day, whose uncorroborated statements of fact are not to be taken seriously. Please, therefore, to state whether it is not true that you have for many years been engaged in speculating in stocks on Wall street, and

have during the last two years lost nearly a half million of dollars in those speculations?

[*Complainant's counsel objects to the above question as grossly unprofessional on the part of Mr. Walker, entirely outside the record on which any legitimate cross-examination can be founded, and informs the witness that he need not answer the question if he does not desire to do so, until the matter is submitted to the Court and the Court instructs him to answer.*]

A. I have nothing to say in answer to this question beyond referring you to my previous answer which is all the answer I intend to give.

[*Cross examination closed.*]

[*Redirect examination waived.*]

[*Defendant's counsel hereby withdraws that part of the objection to the answer to Q.4, which part referred to the secondary evidence of documents, books, entries or copies of letters or documents which had been included in that answer.*]

CIRCUIT COURT OF THE UNITED STATES

FOR THE DISTRICT OF MAINE, IN THE FIRST CIRCUIT.

[Bill in Equity on Letters Patent No. 558,969.]

EASTERN PAPER BAG COMPANY

vs.

CONTINENTAL PAPER BAG COMPANY.

New York, November 6th, 1903.

Evidence taken on behalf of the complainant in rebuttal, before James J. Cosgrove, a notary public acting as a special examiner herein, pursuant to stipulation and agreement of parties herein, under Rule 67 of the Supreme Court for Courts in Equity, as amended, at the office of Betts, Betts, Sheffield & Betts, 120 Broadway, New York City, Borough of Manhattan, beginning Friday, November 6th, 1903, at 2 o'clock, P. M.

[*Met pursuant to notice and agreement.*]

Present—SPECIAL EXAMINER AND NOTARY.
SAMUEL R. BETTS, of Counsel for Complainant.
ALBERT H. WALKER, of Counsel for Defendant.

TESTIMONY OF MELVILLE E. DAYTON.

MELVILLE E. DAYTON, a witness recalled on the part of the complainant, having been first duly sworn to testify to the truth, the whole truth and nothing but the truth, testifies as follows:

[*Direct-examination by* Mr. SAMUEL R. BETTS:]

[Complainant's counsel states that he begins the numbering of the questions addressed to Mr. Dayton with the number 244,

although the last question in this particular case to Mr. Dayton was No. 126, because in the Woodward & Rogers case on the same patent, the last question to Mr. Dayton was No. 242, and it is desired not to duplicate the numbers of any questions addressed him in these two cases on the same patent.

Q. 244. Are you the Melville E. Dayton who gave testimony on the part of complainant on the opening case herein?

A. I am.

Q. 245. Have you read the testimony introduced on the part of the defendants herein, and comprising the depositions of Edward E. Claussen, William A. Lorenz, Charles D. King, Wilbur M. Stone, William H. Honiss, D. M. Des Jardins, L. G. Fisher, Herman Elsas, and William Liddell, and have you examined the patents and other exhibits referred to in connection with said testimony, and introduced on the part of the defendant, including the defendant's machine, known herein as the Walker Model-Room Machine, and do you understand said testimony, patents and exhibits?

A. I have read the testimony, have studied the patents with great care, have fully examined many of the other exhibits, exclusive of letters, contracts, and the like, and inclusive of all that seem to me at all significant in this case from the mechanical expert's point of view, and believe that I understand them.

Q246. What additional experience, if any, have you had in connection with paper bag machines, and the making of paper bags, and matters relating thereto, since you gave your testimony on complainant's opening case herein?

A. I have, since I before testified in this case, been called to act as an expert in another suit relating to paper bag making machinery, and in that connection I have examined, at rest and in operation, one of the machines involved in that suit; have carefully studied numerous drawings submitted to me in that case and illustrating similar machinery, and have made an extended comparison of such machine and drawings with each other and with various, and somewhat numerous, letters patent, showing and describing paper bag machinery, and, in the same case, prepared several affidavits for use upon injunction motions, heard or to have been heard in the United States

Court, Seventh Circuit, Northern District of Illinois. I have also visited, since I last testified in this case, the paper bag factory of the Union Bag & Paper Company, at Sandy Hill, N. Y., and there witnessed, in operation, and at rest, a large number of machines for making paper bags of different kinds, including three kinds of machines for making bags of the self-opening square bottom variety, from tucked paper tubular blanks. Two of the three above mentioned kinds of machines were representatives of certain patents introduced by defendant in this case, namely, the Stillwell Patents, and the Lorenz & Honiss Patent, No. 361,951, these two types of machines—the Stillwell and the Lorenz & Honiss, being, as I understand the facts and the testimony of defendant's witnesses, the principal machines commercially used at the date of the Liddell Patent here sued upon. I have also examined defendant's machine known as the Walker-Model-Room machine, on two or three occasions, while in motion, without and with paper, and when at rest. I have also carefully studied in operation and at rest a successfully operative machine constructed in accordance with the Liddell Patent here in suit.

Q. 247. Has your examination of the testimony and exhibits, etc., taken and introduced on the part of the defendant herein, and the additional experience you have had, as above stated led you to modify in any way the opinions you expressed or the conclusions you reached on your testimony in the opening case herein?

[*Objected to as leading; and also as immaterial, as not calling for facts, but only for a reiteration of opinions which were themselves immaterial because compounded of speculation on points of law and on matters about which the witness had no personal knowledge when he expressed those opinions in his former deposition.*]

A. It has not. On the other hand the soundness of the opinions and conclusions reached and expressed by me in my former deposition has been confirmed by my subsequent experience with paper bag machinery and by the examination of defendant's testimony and exhibits. As to those opinions ex-

pressed by me concerning the operativeness of the machine shown and described in the Liddell Patent sued upon, when constructed with the aid of the judgment and mere mechanical skill of a judicious constructor, which opinions were so flatly contradicted by the experts who testified in behalf of defendant, my said opinions have been fully confirmed by the actual machine constructed in accordance with the Liddell Patent in suit.

Q. 248. Have you seen in operation a paper bag machine containing a diamond forming mechanism, which mechanism is made and operates in accordance with the description of the Liddell Patent in suit and conforming closely to said description, and if so state in this connection any facts which the Court should know in regard to its construction and operation, as observed by you, and in connection with this suit?

[*Objected to as leading; and also as calling for secondary evidence, and also as imposing upon the witness the function of deciding what facts about the alleged machine should be known to the Court; and what facts about the alleged machine should be concealed from the Court.*]

[*Complainant's counsel states that the machine referred to in question, and about which the witness will testify, will be properly identified physically in connection with complainant's testimony in this case, and will be open to the most minute inspection of defendant's counsel and defendant's experts at the proper time and on request being made to that effect by defendant's counsel.*]

[*Defendant's counsel requests that the alleged machine be shown to defendant's counsel now, and before the present question is answered.*]

[*Complainant's counsel states that the proper time for such inspection in his opinion will not be until after the question has been answered, but the inspection referred to will be offered before defendant's counsel is asked to cross-examine the witness. Complainant's counsel now states that if defendant's counsel will now on the record state that he desires on behalf of himself and defendant's expert to see the machine referred to operated in this city of New York on Monday next, or any other specified day, excluding Friday afternoon and Saturday,*

such operation will be arranged for at the time designated, but complainant's counsel must have at least a day's notice in order to make arrangements, and of course does not promise to repeat the performance again and again ad libitum, but will give every reasonable opportunity for inspection.]

[*Defendant's counsel requests that the machine be shown to defendant's counsel and to two or three of the defendant's experts tomorrow, Saturday, November 7th, 1903, at two o'clock in the afternoon.*]

[*Complainant's counsel will not comply with the evidently purposely unreasonable request above made fixing two o'clock to-morrow, Saturday, afternoon as the time for running the machine. It is impossible to arrange for it at that time; an entirely fair and reasonable offer has been made above on the part of complainant's and defendant's will at their own peril neglect to avail themselves of it.*]

[*Defendant's counsel states that he selected Saturday instead of Monday, Tuesday, Wednesday or Thursday of next week, because defendant's expert can be in New York City on Saturday, whereas the principal defendant's expert, Mr. Stone, has a previous engagement on another case in a distant State, covering those four days.*]

[*Complainant's counsel states that he cannot be sure of arranging to run the machine to-morrow, Saturday, at two P. M., on account of the day and the short notice, but if defendant's counsel and expert desire to inspect the machine without its being run to-morrow, Saturday, at two P. M., such inspection will be allowed in the presence of defendant's counsel and expert.*]

[*Defendant's counsel states that he wants to see the machine, and see it running with the defendant's experts to-morrow at two o'clock in the afternoon.*]

[*Adjourned to Saturday, November 7th, at 10:30 A. M., same place.*]

Saturday, November 7th, 1903.

[*Met pursuant to adjournment.*]

Present—Counsel as before.

[*Mr. Dayton's answer to Q. 248 continued.*]

A. I have seen both at rest and in operation a paper bag machine containing a diamond forming mechanism made and operating in accordance with the description given in the Liddell Patent in suit, and conforming very closely to said description, and particularly so as to the form and arrangement of the "side-forming fingers" GG and HH on the cylinder and forming-plate, respectively, and as to the mechanism composed of cams and gears for operating the forming-plate E. I especially mention these features because they were the subject of especial attack by defendant's counsel in my former cross-examination and in defendant's testimony, the contention of counsel for defendant and of his witnesses being, as I understand it, that these particular parts of the machine shown and described in the Liddell Patent are or would be inoperative.

By "form and arrangement" of the side-forming fingers GG and HH I mean their form as mere swinging fingers thrown laterally into the tucks of the tube as shown in the Liddell patent drawings, and the arrangement of said fingers to stand parallel with the forming-plate and as nearly parallel with the surface of the cylinder as its convexity permits, so that said fingers do not clamp or bind the paper to either the forming-plate or the cylinder. The end finger marked E′ in the Liddell patent, which is described as on and moving with the forming-plate E is, in said machine, made longer and nearer to the forming-plate than shown in the patent, but is neither so long nor so near the plate as shown in the prior art, or as employed in defendant's "Walker Model-Room Machine."

Before entering into a detailed description of this Liddell machine, with drawings which I propose to produce, I state that with such fingers, so formed and arranged in accordance with the Liddell patent, this Liddell machine has in my presence run out three several lots, continuously, of two thousand 2-pound paper bags in each run, at the rate of 130 to 135 per

minute with less than 2 per cent. waste, and that these three different runs were made upon paper of different thicknesses and qualities, one after the other, without any readjustment of any of the parts of the machine. I have here present five hundred bags made in each of these different runs, besides a special lot comprising the last hundred of each of the above mentioned runs of two thousand each, *unassorted*, or with any defective bags therein which were turned out by the machine, and I have also all the bags which were selected out as defective in each and all of said runs of the machine. The three runs referred to were made November 5th, instant, and on the same day and following said three runs, a higher speed was given to the machine for an additional run of one thousand bags, 500 of which, assorted, together with the last hundred of which, unassorted, I have also here present. I have also here present and now produce, with the foregoing all the waste or defective bags made in the last run of one thousand bags, turned out at the rate of 140 to 144 per minute.

To be more specific as to the exact rates of speed and the exact number of defective bags produced in each of the above runs I state that, as marked by me at the time on the final hundreds of the several runs above referred to, the first run of two thousand was made at an average speed of 130 per minute from "Lion" paper, and in that run 12 defective bags were produced, being 6-10 of one per cent.

In the second run the paper used was of the grade known as "Buffalo" paper, understood to be a somewhat heavier paper than the "Lion" brand and much more brittle, or "brash." In this second run 34 bags were thrown out as defective, or less than one and eight-tenths per cent.; average rate 133 per min.

For the third run "Elephant" paper was used, the run was made at the rate of 133 per minute and seventeen bags were thrown out as waste, being less than 1 per cent.

In the fourth run of one thousand the same "Elephant" paper was used, the run was made at the rate of 140 to 144 per minute and seventeen bags were thrown out as defective, or at the rate of 1 7-10 per cent. waste. As stated, these sample hundreds here produced were not assorted and still contain any defective bags (if any) made in their production.

Now describing this Liddell machine, as it may be called, I first state that, to make a complete machine, including mechanism for forming the tucked paper tube to be operated upon by the Liddell diamond-forming mechanism and to complete the bag after the Liddell diamond-forming mechanism has finished its work (by pasting the diamond and folding the flaps thereof and delivering the completed bags ready to be assorted and packed), the Liddell diamond-forming mechanism is put into an old machine having the additional devices mentioned, in place of the original diamond-forming devices of said old machine. This old machine bears the number 88, and was obtained by Mr. William A. Lorenz (who had charge of the building of the Liddell machine), from the lot of machines used at Sandy Hill, N. Y., and embracing the features of the two Lorenz and Honiss patents, No. 361,951 and No. 321,721. The blank tube former is that of said Lorenz & Honiss Patent No. 321,721, changed to form the longitudinal seam of the tube on the upper side instead of the lower side. The "striker" or device for separating the tube into blanks, or sections, one for each bag, is taken from the Lorenz & Honiss patent 361,951. In connection with the separation of the tube into bag blanks by means of the striker a slack-making device is employed which makes a slack in the continuous tube for the purpose of facilitating its separation by the striker. And in connection with the slack-making devices the feed and holding roll which receive the separated blanks and deliver them to the cylinder, are made to separate to permit the slack to be made and then to close again for the blanks, which they carry forward at the usual accelerated speed. These features are derived from the Stillwell patent No. 417,346 and the Lorenz patent No. 444,728.

All the foregoing matters are outside the Liddell patent in suit, which does not concern itself with the mechanism for forming the continuous, bellows-sided tube, with the mechanism for separating the tube into bag blanks, or with particular mechanism for feeding the blanks to the cylinder and diamond-forming devices. Said Liddell patent merely shows rollers DD in Fig. 1 as representative of the usual means for delivering the bag blanks to the diamond-forming machine proper.

The Cylinder of the Liddell Machine.

Coming now to the Liddell part of the machine, the cylinder, answering to the cylinder C of the Liddell patent, is a "4-bag" or 4-bed cylinder, instead of a 2-bag or bed cylinder, as shown in the patent. In other words the cylinder is relatively larger than shown in the Liddell patent, which, however, provides for making the cylinder of any desired diameter, or, which is the same thing, with any desired number of beds for making the corresponding number of diamonds thereon in one revolution of the cylinder. In saying that the cylinder is a 4-bag cylinder instead of a 2-bag cylinder as shown in the Liddell patent I mean that it is provided with 4 successive central clips or nippers *c* equally spaced about the cylinder to successively receive the bag blanks, in accordance with the Liddell patent. Correspondingly the cylinder of the Liddell machine has four pairs of side fingers answering to G G of the Liddell patent, pivoted to the cylinder on radial axes outside the path of the bag blanks and thrown inward into the opposite side tucks of the blanks by means of stationary cams at the proper times and retracted at the proper times by springs, as in the Liddell patent in suit. The end clips *c c* for gripping the advanced end of the lower ply of each of the blanks to the bed or cylinder are of the same pivoted form shown in the Liddell patent, but instead of the old newspaper printing-machine device shown at C′ *c*′ in the patent, acting in conjunction with the stationary pins C2, C3, for throwing these end clips into and out of action, the more usual actuating devices employed in paper bag machines are used consisting of a stationary cam for opening and holding open said clips or grippers, and springs (one for each) for closing them, in substantial accordance with the Lorenz & Honiss patent No. 361951.

The foregoing comprises all that need be here said about the cylinder of the Liddell machine, except that the large size of the cylinder adopted permits its use as a support for the bag in the operations of applying the paste to the diamond after the formation of the latter and the performance thereon of the creasing necessary to the folding of the end flaps of the dia-

mond preparatory to completing the square pasted bottom And in this connection I mention the addition of features not at all concerned in the formation of the diamond itself, but belonging to the pasting and flap-folding operations referred to. First, I mention the presence of two additional end nippers arranged one on each side of each central end clip *c*, which seize the front end of the diamond after its formation and thus permit the withdrawal of the central end clip *c* out of the way of the pasting roll, which is arranged opposite the cylinder at the appropriate point for pasting the diamond preparatory to folding the end flaps thereof. This pasting roll is provided with two transverse flap creasers or blades which define the flap folds and, for their accommodation, two transverse grooves are provided at the proper points in the periphery of the cylinder. The groove to receive the blade which defines the fold for the rear or second flap is made quite deep, and there is provided therein a clamping jaw which seizes and holds the paper pressed into it as the blade is withdrawn. This added device belonging to the flap-folding scheme is something which is well known in the prior art and in no wise relates to, or affects, the diamond-folding mechanism of the machine.

[*Recess.*]

[*Answer to Q. 248 resumed.*]

I will have a drawing prepared showing the cylinder with its various clips and fingers, in conjunction with the pasting and creasing roll above referred to, illustrating the matters so far described, in side view, clearly to the Court. Meantime I proceed to describe the FORMING-PLATE AND OPERATING PARTS of the Liddell machine, and in this connection I submit a blue-print containing two figures entitled "Liddell Paper Bag Machine. Forming-plate. Operating parts." In this drawing the same designating letters and characters are used that are employed to designate the same parts in the drawings of the Liddell patent. That is to say, C in each of the two figures represents the cylinder or rotary bed structure of the patent of which D is the axial shaft. *c* is one of the four central end clips on

the cylinder, and G is one of the four pairs of side-forming fingers pivotally mounted on the cylinder C. F is one of the two parallel arms secured to the rock shaft *f* and supporting at their free ends the oscillatory shaft *e* to which is secured the forming-plate E, all in accordance with the Liddell patent in suit. F′ is also the arm of the Liddell patent secured to the rock-shaft *f* for engagement with the cam K′ of the patent, by which cam the arms F are raised and lowered. It will be seen that upon the free end of the arm F′ there is mounted a roller for direct engagement with the cam, similar to the roller shown near the letter *k* on the slide *k* of the Liddell patent for bearing upon the cam K. The application of the roller to the arm F′ is for the purpose of reducing friction and is no departure from the patent, obviously, because such "friction-rollers" or "anti-friction rollers", as they are variously called, are usually employed in this relation in paper bag machines as in machinery generally. M′ M M and N are the four gears bearing the same letters in the drawings of the Liddell patent, N being a gear-wheel secured to the oscillatory shaft *e* to which the forming-plate E is fastened; M′ being the rack-gear of the patent loose upon the shaft *f*, and MM being the idle gears intermediate to M′ and N for transmitting movement from the rack-gear M′ to the shaft *e* and forming-plate. The gear-wheel N is seen to be smaller, as compared with the rack-wheel M′, than shown in the Liddell patent. This is simply to obviate the use of a larger cam K for oscillating the rack-gear M′, and is a mere constructor's expedient. The slide *k* of the machine and blue-print corresponds with the slide *k* of the patent, but is made larger in proportion in width to give it desired rigidity and, in the actual machine, is mounted in a stationary guide similar to the guide shown in the Liddell patent drawing, but omitted from the blue-print.

All these gear-wheels M′ MM and N are supported on the far side of the further arm F, as illustrated in Fig. 1 of the Liddell patent in suit, the machine standing in position before the observer with the cylinder C rotating clock-wise, or with its top moving to the right. The link *k*2, connecting the rack-gear M′ with the slide *k*, is shown in the blue-print as being pivoted

to the side of the rack-gear M′ instead of to an arm fastened to said rack-gear and projecting beyond its periphery. This is not a variation in principal or mode of operation, being merely a variation in the length of the leverage or of the radius through which the reciprocating slide *k* acts upon the rack-gear to rock the latter in accordance with the Liddell patent.

Coming to the cams K and K′ of the Liddell patent these cams in the Liddell machine are made as grooved cams, the grooves of which receive the rollers on the arm F′ and the slide *k*. The coiled spring shown in Fig. 1 of the Liddell patent drawing as drawing the arms F downward is, therefore, omitted from the machine, since the outer wall of the cam groove in the cam K′ performs the same function as the spring. The groove of the cam K embracing the roller on the inner end of the slide *k* does the same work with respect to said slide and the parts connected therewith. In other words, the cam grooves actuate the rollers and the parts connected therewith in both directions in the well known manner of "grooved" or "box" cams in paper bag machinery, as in other machinery employing cams and requiring this provision. The grooves of these cams are not shown in the blue-print which has not been prepared to be made an exhibit in this case. I use it here because I have no other drawing which illustrates the part about which I am speaking, but I propose to have an additional drawing made to show these cams precisely as they are present in the Liddell machine.

So much having been said by defendant's counsel and defendant's expert witnesses concerning the defects of the cams K and K′ of the Liddell patent because they are not shown there as grooved cams, and defendant's expert, Mr. Stone, having testified as though no such thing as a grooved cam was known in the mechanic arts with which he claims to be familiar, I shall point to certain instances of the use of grooved cams in paper bag machines as shown by defendant's patent exhibits in this case, but first I quote from Mr. Stone's deposition as follows: In his answer to question 49, page 251, D. P. R., he says:

> "The mechanism is lacking in at least one element, to "wit.: means for keeping the cam end of arm *k* in contact "with the periphery of its cam."

and in his answer to x-Q. 117, page, 280, he says:

> "A. It would be obvious to a skilled mechanic that "some means should be provided for holding the roll, "and the plunger *k*, against its co-acting cam; and while "it would be within his skill to apply the necessary "means, it would not be obvious just how or where to "apply those means; or what specific means to use; but "it would be quite within his ability to both devise and "apply such means."

I take up some of the defendant's prior patents at random and the first one I open is the Lorenz & Honiss patent No. 361,951. As the printed copy has separated between the last page of drawings and the first page of the specification, the first drawing upon which my eye lights is sheet 14 of that patent, whereon are Figs. 43, 44, 45 and 46, every one of which happens to show a grooved cam, indicated by dotted lines at 446 in Figs. 42 and 43 and at 445 in Figs. 44 and 45. Figs. 35 and 36 on sheet 12 of the same patent show a grooved cam at 380. In Fig. 25 the topmost roll, or wheel, 220, shows a grooved cam. Figs. 19 and 20 show grooved cams at 128 and 129 in the peripheries of cam wheels. Friction rollers attached to arms or parts actuated by these cams are shown in said cam grooves in every instance. The next patent I take up at random is No. 331,722 to Lorenz & Honiss, the last Figure 34 of the drawing of which shows rollers 209 working in cam grooves in the wheels 210. The next patent I take up at random is No. 337,965, to Lorenz & Honiss, in Fig. 6 of which is shown at the extreme left hand a disc 108 having a cam groove in its side-plate in which works the roller 109 on the end of the slide 110. Changing to another group of patents I take up the Cross patent, No. 222,464, which shows at *i* a grooved cam in which runs a pin *j*, which may or may not have a friction roller. The next patent I take up at random is the Crowell patent, No. 510,410, which shows in Figs. 3, 4 and 5, a grooved cam 34, which is in part indicated by only a single line and not altogether by two lines, representing both walls of the groove, as in the patents I have already mentioned. Not to continue these citations I

repeat that such cams are not only well known in general machinery, but are exceedingly common in the art of paper bag machinery, and I recall several instances, including defendant's patents to Claussen and others, wherein such grooved cams are employed. Wherefore I regard the grooved form of the cams K and K′ used in the Liddell machine as only a fair mechanical execution of the instructions given and disclosures contained in the Liddell Patent.

Next taking up the contour of said cams K and K′, as worked out in practice in the Liddell machine, such contour is accurately shown in the blue-print. It naturally differs from the contour of said cams shown in Fig. 1 of the Liddell patent, as cams usually do when laid out for a practical machine, in comparison with the showings of patent drawings which rarely profess to be working drawings or exact delineations of parts from which a working machine may be built. Moreover these cams K and K′ in one working machine may differ in contour from those of another working and equally practical machine made from the same patent, the cams being dependent for their exact outline upon various conditions, such as the proportions of the parts they are to actuate, which proportions may often be varied greatly without in the least departing from the principles of the patent or invention.

I did not myself lay out these cams, as shown in the blue-print, "Liddell Paper Bag Machine Forming-plate, Operating Parts," but have been shown the appliances employed in defining them, and have here a blue-print which I have compared with said appliances, and in connection with which I will briefly explain the operation, which is only the ordinary machinist's method of proceeding. The drawing referred to is entitled "Liddell Paper Bag Machine—Yoke and Slide Cams and Graduated Disc—Plates for Positioning the Forming-plate Edge when marking Cams."

[*Adjourned to Monday, November 9th, 1903, at 10:30 A. M., same place.*]

[*Monday, November 9th, 1903. Met pursuant to adjournment.*

Present—Counsel as before.

(Mr. Dayton's answer to Q. 249 continued.)

The term "Yoke" in the above title of the drawing applies to the rock-shaft *f* of the Liddell patent and the two parallel arms F F rigidly secured thereto. The term "Yoke-cam," therefore, applies to the cam K′ of the patent by which this yoke or pair of arms F F are actuated through the arm F′, also rigidly secured to the shaft *f* and engaging the cam. The "slide cam" of this title is the cam K which actuates the slide *k* for rocking the rack wheel M′. I write a briefer title on the drawing last presented, to wit: "Drawing Liddell Cam Delineating Devices."

In this drawing "Liddell Cam Delineating Devices," Fig. 1 shows a disc secured to the cam shaft L (which is also the driving shaft of the machine) said disc being graduated, as shown, into 36 equal spaces, marked 1 to 36, the 36 mark being also zero. Each space of the scale, therefore, embraces 10 degrees of the circle. Fig. 2 of the drawing represents the outline of a guide-plate the upper edge of which represents the desired path of the edge of the forming-plate in its advancing movement for the formation of the diamond. This plate is marked on the drawing "Forward Stroke Plate," and I additionally mark it more briefly "Plate No. 1." Fig 3 of the drawing shows a similar plate the upper edge of which represents the arbitrarily chosen path of the edge W of the forming-plate in its return to its original starting point after having operated upon a blank to form the diamond. This plate of Fig. 3 is marked "Return Stroke Plate" and, more briefly, "Plate No. 2."

In this particular Liddell machine the cylinder, as already explained, has four beds or sets of devices concerned in forming the diamond on blanks, and its periphery, therefore, advances only ¼ of a revolution during one full revolution of the graduated disc of Fig. 1. Accordingly the arc of a circle on

Plate No. 1 seen between 4 and 15 and corresponding to the curve of the cylinder periphery, is divided into equal spaces each of which is equal to 1-36 of ¼ of the periphery of the cylinder, and the marks dividing these spaces on the plate are numbered consecutively from 4 to 15. The distance between 36 or 0 and 4 on Plate No. 1 represents the travel of the edge of the forming-plate from the starting point at 36 to the point where it presses the blank to the cylinder at 4, and it includes markings 1, 2 and 3 of increasing distance apart, arbitrarily determined with a view of starting the edge of the forming-plate slowly from its position of rest and accelerating its motion until, when it reaches the point 4, its speed equals that of the cylinder periphery. In like manner the edge of the forming-plate from the point at 15 where it leaves the cylinder in its forward stroke to where it comes to rest, is to be retarded. The spaces marked on Plate No. 2, representing the return stroke of the forming-plate edge are more widely varied, increasing in length from the right to the middle and decreasing from the middle to the left extreme point 36, when it comes to rest and whence it is to start on the next operating stroke.

To first determine the shape of the cams K and K′ in those portions thereof concerned in giving to the forming-plate its forward stroke and in guiding the edge of said forming-plate in accordance with the shape of the upper edge of Plate No. 1 and with the relative speeds indicated thereon, said Plate No. 1 is temporarily supported in a fixed position in the machine beneath the forming-plate, so that when the forming-plate is moved from left to right with its free edge in contact with the upper edge of said plate, the forming-plate will take the exact course which it is desired to have in the actual working machine under the action of the cams K and K′, one of said cams K′ operating to raise and lower the yoke or arms F F, and the other cam K operating to rock the rack-gear M′ to properly act through the intermediate gears M M and N upon the forming-plate, all contemplated in the Liddell patent. There are now supposed to be no cams whatever in the machine, but the yoke and slide mechanism are present therein in their regular bearings in the frame. On the cam shaft L are placed and securely

fastened two zinc plates or discs, one contiguous to the roller on the yoke-cam arm F′ and the other contiguous to the roller on the slide *k*. Starting with the edge of the forming-plate resting on the guide-plate No. 1 at 36, as shown in Fig. 2 of the "Drawing Liddell Cam Delineating Devices," a scratch is made on each of the zinc discs or plates beneath each of said rollers, which mark shows, of course, the position of the surface of each of said cams requisite to the support of the forming-plate in this initial position. Then the graduated disc of Fig. 1 is moved on its axis until the numeral 1 is brought opposite the fixed pointer (which was opposite the point 36 in starting, as shown in Fig. 1) and there the disc is left at rest. In this movement of the disc the zinc plates affixed to the cam-shaft which carries the disc will also have been moved the same distance in the same direction. Now the edge of the forming-plate is moved along the guide-plate No. 1 and brought to rest at the point marked 1. This movement of the forming-plate has involved an upward movement of the yoke arms F F, a rotary movement of the gears N M M and, possibly, some rotative movement of the rack-gear M′ and a lengthwise movement of the slide *k*. And, preferably, this and other desired advanced positions of the edge of the forming-plate on the guide-plate No. 1 will be effected by screw-pressure applied directly to the several rollers on the yoke and slide, because these rollers are the media through which the cams are ultimately to give such positions to the forming-plate. With the forming-plate standing with its edge at 1 and the graduated disc standing with its point 1 in line with the pointer, another scratch is made on each of the zinc plates beneath the roller, indicating the desired position of the surface of the cams K and K′ to bring the edge of the forming-plate to point 1 of its advance movement.

In a similar manner the disc is next moved to bring point 2 in line with the fixed pointer and the yoke and slide are moved to bring the edge of the forming-plate to point 2 on the guide-plate No. 1, and when this is done the zinc plates are scratched again to show the positions of the roller and the necessary location of the surface of the cams to bring the edge of the forming-plate to this point 2. In similar manner the disc of Fig. 1 is rotated step by step and brought to rest with each of its

successive graduations in line with the pointer and, at each position of rest of the graduated disc, the edge of the forming-plate is brought to the corresponding number on the guide-plate No. 1, the zinc plates being scratched adjacent to the contiguous rollers at each stationary position of the graduated disc and forming-plate. This completes the markings on the zinc plates which serve to determine the outline of those portions of the cams K and K′ concerned in the proper movement of the edge of the forming-plate forwardly over and with the cylinder in forming the diamond. It will be observed that, in the operation above described in the use of the "Forward Stroke Plate" of Fig. 2, the yoke-arms are first lifted and then lowered, as indicated by the full and dotted lines above the plate No. 1 in Fig. 2, which lines indicate the forming-plate in several of its positions, along with the shaft *e* to which said plate is affixed. It will also be observed that the graduated disc will have been turned only half way around or far enough to bring the mark 18 in line with the fixed pointer.

To delineate the remaining portions of the outlines of the cams K and K′ the Return-Stroke Plate or Plate No. 2, shown in Fig. 3, is put in place of the Forward Stroke-plate of Fig. 2, while the graduated disc remains with its point 18 at the pointer and while the forming-plate E remains at its extreme right-hand position at the end of its forward stroke, as shown by dotted lines in Fig. 2 of the drawing. Inasmuch as the return stroke of the forming-plate may be given any desired rapidity, the constructor has provided that it may rest or "dwell" at each extreme of its throw. According to this drawing he has provided that the forming-plate shall not start back until the graduated disc shall have been turned three of its 36 graduations. Said disc will therefore be moved from 18 to 19 and the zinc plates scratched and then again from 19 to 20 and the plates again scratched, and finally from 20 to 21 and the zinc plates again scratched, before any backward movement whatever is given to the forming-plate. But when the disc is moved from 21 to 22 the forming-plate is moved backward to 22 on Plate No. 2, and the zinc plates scratched again. Then the graduated disc is moved another graduated number, and while

left standing at rest the forming-plate is moved a corresponding number on the Plate No. 2 and the zinc plates again scratched. This process is continued right along until the graduated disc is brought back to its original starting point with 36 at the pointer and with the edge of the forming-plate at 36 of the Plate No. 2, which corresponds precisely with 36 on Plate No. 1, or in other words, with its original starting point. The constructor has chosen that the forming-plate shall reach its original starting point when the graduated disc has been moved to bring its point 34 opposite the pointer, giving said forming-plate a period of rest, in this position, of two numbers, from 34 to 36, so that the last two steps of movement of the graduated disc are made without any movement at all of the forming-plate. But the zinc plates are marked at every time when the graduated disc is brought to rest after being moved.

If desired, the graduations on the disc may be divided into as many shorter spaces as are thought to be called for for minute accuracy, and the steps of rotation made correspondingly shorter, and the markings on the zinc plates correspondingly more numerous and closer together, the forming-plate being of course, always moved correspondingly with the steps of movement given the disc.

After the marking of the zinc plates in the manner above described, they are removed and the proper line is drawn through the prominences of the scratches and the plates are cut to these lines. The result is a template for each of the cams K and K′ in conformity with which the cams will themselves be cut. And when these cams are put into the machine on the shaft L they inevitably cause the forming-plate to take the several courses indicated in Figs. 2 and 3 of the Drawing Liddell Cam Delineating Devices.

Of course these cams could have been laid out on paper; but the method adopted is the one more commonly pursued both because it is the easier method and because it is one within the knowledge of the mere mechanic, as distinguished from that of the skilled draughtsman. And it is the better method because it conforms with the actual relations of the various centers as

they exist in the machine, while a paper drawing, based upon measurements taken from the machine may vary by inaccuracy of measurement and by shrinkage and expansion of the paper under different conditions of the atmosphere.

Perhaps I should point out that the notched pins shown at the left upper corner of the "Return Stroke Plate" of Fig. 3 of the Drawing Liddell Cam Delineating Devices, are removable and that they are employed because the constructor has chosen to give the forming-plate edge an upward movement as it approaches the starting point and then a downward movement to said point of starting, and has chosen to use the forming-plate itself in following the edges of the guide-plates instead of providing a laterally projecting point or slender arm continuous with the edge of the forming-plate and acting against the continuous edge of a solid plate No. 2, placed at one side of the forming-plate and in the path of said slender arm. When the edge of the forming-plate in the return movement above described passes from say Point 30 to Point 31, which points are determined by notches in the outer end of these pins, it is necessary to remove the pins (or at least the higher ones of the pins) at the right of 31 in order that the forming-plate may descend to the notch in upper end of 31.

The object of giving the forming plate edge a somewhat increased elevation as it approaches the starting point 36 is obviously to give ample room for the introduction of the advanced end of the bag blank beneath said plate. Had the constructor desired so to do he might have given the edge of the forming-plate a more elevated path throughout than he has shown, in which case the cams would have been correspondingly varied in outline.

I have made the explanation of the method of delineating the cams K and K′ of the Liddell patent so lengthy as I have because this is one of the mechanical operations practised by machinists, whose simplicity in fact becomes more plain from minute description. Once understood it is readily seen to involve no mystery or practical difficulty whatever.

Resuming my description of the Liddell machine I again refer to the drawing previously mentioned and entitled "Lid-

dell Paper Bag Machine, Forming-Plate Operating Parts" (more briefly designated "Drawing Liddell Forming-Plate Operating Parts"), as showing the forming-plate at E with its central lifting-finger E′ between which and the plate E the end of the upper ply of the bag blank enters, and the side-fingers H H pivoted to the forming-plate and swinging inward into the side tucks of the blank for the purpose of lifting the sides of the upper ply of the blank and defining the adjacent folds of the triangles formed in the sides of the diamond made from a bellows folded tube.

I think the central finger E′ as shown in this Drawing Liddell Forming-Plate Operating Parts is precisely of the dimensions and precisely the distance from the forming-plate of the actual plates in the machine. It is both longer and closer to the plate than shown in the drawings of the Liddell Patent, where it is agreed to be shown too short and too far away from the plate to well serve its purpose. But, as has been shown by defendant's patent exhibits, similar fingers have been used before in the art, both longer and nearer to their supporting parts even than shown in this drawing or than present in defendant's machine. This would, in my judgment, be a sufficient reason for regarding the length and proximity to the plate of this finger E′ a matter of judgment on the part of the constructor, though I additionally am of the opinion that if no such finger had ever been used in the art, the constructor would have been at liberty under this Liddell patent to lengthen said finger to any desired degree and to bring it to any desired degree of proximity to the forming-plate called for by its best operation in a practical machine. It is my opinion even that a positively clipping or clamping finger mounted movably on the plate and adapted to grip the upper ply firmly to the plate at this point, was within the mechanical choice of the constructor, because, as shown by defendant's patent exhibits, such a positive end clip for the upper ply was well known in the art. However, the actual Liddell machine has an immovable finger like that of the Drawing Liddell Forming-Plate Operating Parts, and said machine is practically operative and highly successful in the use of such finger, as the actual results show, in the bags produced by me and already referred to.

[*Recess.*]

As clearly indicated in said Drawing Liddell Forming-Plate Operating Parts, the vibratory forming fingers H swing in a plane parallel to the adjacent surface of the plate, but entirely clear thereof throughout their entire swing. Said fingers are in no wise changed from the corresponding fingers shown in the Liddell patent in suit, except that the extreme ends are slightly beveled or bent, as shown in Fig. 1 of this drawing, to facilitate and insure the ready entrance of the fingers into the tuck of the tubular blank.

In said Fig. 1 of this drawing the fingers H on the forming-plate and the fingers G on the cylinder stand opposite each other, the plate being in its starting position, and in this conjunction of the fingers G and H, it will be observed that the cylinder fingers G are made a little shorter than the fingers H and that their tips are also slightly beveled or bent, for the same purpose of favoring their certain and ready entrance into the tucks of the blank. The shortening of the fingers G slightly, as shown, is to avoid any interference between said fingers and the fingers H which might result from the bending of the finger tips as described.

In the Liddell patent it will be remembered that the forming-plate is shown in Figs. 2, 3 and 4 as having eyes E2 at its opposite corners and that to the frame are secured projections A′ over which these eyes E2 are thrust as the forming-plate assumes its starting position. These eyes and projections, thus engaged, are said in the patent to maintain the edge of the forming-plate out of the line of the bag 2 in its entry between the plate and the cylinder. Essentially the same devices are present in the Liddell machine, but the parts are reversed. That is to say eyes or notches E2 are provided and supported in fixed position from the frame and short projections A′ are secured to the forming-plate in positions to enter the eyes or notches E2 as the forming-plate comes to rest in its starting position. The transposition of the parts is in the interest of lightness in the moving forming-plate, while the function and mode of operation is in no wise changed.

In the actual machine the opposite side fingers of the cylinder are connected with each other in the manner shown in Fig.

2 of the Liddell patent, so that one cam I′, affixed to the frame of the machine operates both fingers of the pair, simultaneously. In like manner the fingers H pivoted to the forming-plate are connected together in the form and manner, essentially as shown in Fig. 2 of the patent, so that both are operated together by a single cam I placed at one side of the machine. In the patent said cam I is shown in Fig. 1 as a long bent bar having a short cam-acting surface (as seen in Fig. 2), the cam bar being given this length for the purpose of giving it attachment to a particular part of the machine frame somewhat remote from the position of the cam-acting portion thereof. In the actual machine it has been found convenient to give immediate support to the cam I from an adjacent part of the frame, and said cam is therefore shown to be no longer altogether than the length of its working face. This cam stands in position to be struck by an arm H2 projecting from the hub of one of the connected fingers H on the forming-plate, as seen in Fig. 2 of the patent. This arm H2 is shown in both Fig. 1 and Fig. 2 of Drawing Liddell Forming-Plate Operating Parts, Fig 1 showing the arm striking the cam I to throw in the fingers in beginning the operation upon a bag blank and Fig. 2 showing said arm H2 after having passed the cam I to allow the fingers of the plate to be retracted by a spring.

It will be remembered that one of the discoveries and allegations of defendant's expert, Mr. Stone, was that in an attempt to return the forming-plate after the making of a diamond, the arm H2 would clash with the cam and make the return of the plate impossible or would break the machine. This is the third count of his indictment of the Liddell patent, as expressed in his answer to Q. 11, his statement on this particular point being found on page 189, where he says:

> "*Third.* There is no provision in the Liddell patent for "the return of the arm H2 to the position shown in Figure "2, after the completion of its forward stroke over the face " of the cam I. After completing this stroke, said H2 will "drop off the end of said cam, near the character F in "Figure 2. Said arm H2 in starting on its return move-

"ment will promptly collide with said rear end of cam I.
"Also, as said arm H2 is then held by the spring J, against
"the stop J', said arm is not free to fall back any further,
"but will be stopped in its return movement, and the ma-
"chine rendered inoperative."

As a matter of fact there is no such difficulty. Mr. Stone overlooked the fact that the forming-plate changes its direction in its forward movement and that the arm H2, in striking on its return movement the end of the cam I off which it drops in going forward, is movable toward the forwardly projecting edge W of the forming-plate, just as it is when the plate is reversed and moves forward from its starting position. The stop J' therefore is no more in the way of the arm on the return movement than it is on the advancing movement of the plate. Fig. 2 of Drawing Liddell Forming-Plate Operating Parts shows the forming-plate as having commenced its return movement and shows the arm H2 striking the right-hand end of the cam I, just as Fig. 1 of said drawing shows said arm as striking the cam I in the early advance movement of the plate.

In the Liddell machine the forming-plate operating parts are placed over the left upper quarter of the cylinder, as faithfully shown in the "Drawing Liddell Forming-Plate" Operating Parts, instead of directly over the top of the cylinder as shown in Fig. 3 of the Liddell Patent. This obviously makes no difference whatever with the operation of the parts and the change in this respect is explained by saying that, using the cylinder surface at the right hand of the forming-bed for the support of the blank in the pasting and creasing operation and to avoid carrying these operations beneath the cylinder, the forming-plate operating devices are moved along to the position shown in the drawing.

It remains to be added that two parts are added to the Liddell machine not shown in the Liddell patent. One is a guide-plate, shown in bent dotted lines in this drawing beneath the cam-shaft L and extending at its right-hand end nearly to the edge of the forming-plate when the latter is in its receiving position. This is the usual stationary plate commonly employed in

paper bag machines over the path of the blanks to guide them properly to the devices intended to act upon them, in this case to guide the blank beneath the forming-plate, in line with which it is seen to be arranged. The other added device is a wiper-plate, flattening-plate or ironing-plate, as it is variously called. Such flattening devices are common in various forms and variously mounted. In this case it is a plate movably mounted upon a vibratory arm projecting to the left and transversely over the cylinder, said plate extending over the forming-plate when in its extreme right-hand position, and adapted, when lowered upon the finished diamond, to flatten the paper of the diamond, sharpening its folds and confirming the folds of the paper in the diamond form given it by the devices already described.

Both a guide-plate and a diamond-flattening device are employed in defendant's Walker Model-Room Machine and both are common (as already stated of the guide-plate) in connection with the diamond-forming mechanism of paper bag machines.

This plate for flattening the diamond preparatory to its passing to the pasting and flap-folding devices is not shown in the Drawing Liddell Forming-Plate Operating Parts or in any other drawing so far prepared. It is, however, shown in Nos. 1 and 5 of the series of photographs taken from the Liddell machine which I now present and which are severally marked "Liddell Machine Photo" and with the numbers 1 to 5.

Briefly describing these photographs, "Photo No. 1" is a perspective view of the Liddell Machine, including the tube-forming mechanism seen at the left; the flattening, pasting, flap-folding and printing devices, seen at the right-hand end of the main machine and at about the transverse middle of the photo, together with the bag-carrier and delivery mechanism seen back of the table, which table is used for assorting and tying up the bags into primary packages of 100 each.

Photo No. 2 is a perspective of the top of that part of the machine directly related to the Liddell patent, together with the adjacent pasting and flap-creasing devices. This photo shows the forming-plate retracted to its initial or starting position just ready to begin the opening of a blank, seen to have its

lower ply centrally clipped to the cylinder by clip C and its upper ply beneath the finger E′ on the forming-plate. A diamond-folded blank is seen at the right passing under the pasting and creasing roll or sector. The flattening-plate is removed in this view.

Photo No. 3 shows the same parts as Photo No. 2, but with the forming-plate thrown forward into its advanced position, as when about to be withdrawn from a blank upon which it has already taken part in folding the diamond. No paper is shown in this view.

Photo No. 4 shows the parts in the same positions as in Photo No. 3, but with the paper of a blank present on the diamond-forming devices and folded to the diamond form, ready to be withdrawn from the forming-plate and its fingers. It will be understood that the side fingers of the forming-plate will be immediately retracted to allow of the forward movement of the blank and its withdrawal from the forming-plate. The flattening-plate has been removed in this view, also, to better show the parts and the blank which it would cover partially, if present.

Photo No. 5 is a similar, but somewhat less angular view of the same parts that are shown in Photos Nos. 2, 3 and 4. In this Photo No. 5 the diamond has been formed and is about to be withdrawn from the forming-plate and its fingers, and the flattening-plate is present in its lowered position ready to wipe down the folds of the diamond as the latter shall pass beneath its right-hand end in the further advance of the cylinder, and just prior to the application of the paste and to the flap-creasing of the diamond.

The parts of the machine at the right of the diamond-folding devices, for pasting, flap-creasing, flap-folding, carrying and delivering need not be particularly described, since they are outside the Liddell invention and patent, and concerning which the patent says, page 2, line 87:

> "It is quite evident that the delivery, paste, and subse-
> "quent folding devices may be made in any of the well-
> "known manners, and their particular construction is im-
> "material to my invention. I do not therefore deem it

"necessary to describe the minute details of these devices, "but illustrate them so as to show their relative positions "in a machine of the class described."

I will merely state that most of these terminal devices of the complete bag machine No. 88 into which the Liddell diamond-forming mechanism has been introduced, are those of the original or old machine, some changes, or additions, being made for the adaptation of them to the cylinder or rotary bed of the Liddell mechanism. In this connection I will say that the particular size of the Liddell cylinder adopted for this machine appears to have been chosen in part with reference to filling up the gap made by the removal of the old mechanisms for the reception of the mechanisms of the Liddell patent.

[Defendant's counsel objects to the foregoing answer to Q. 248 on the following grounds:]

[First. Whereas, the question is confined to the existence, construction, and operation, as observed by the witness of a hypothetical paper bag machine said to have been made and operated in close conformity to the Liddell patent in suit; the answer contains no statement of the existence, construction or operation of any such machine.]

[Second. The answer contains more than nine thousand words on a large variety of topics, including secondary testimony of mechanisms alleged to be shown in a number of specified, and in a number of unspecified patents and machines other than the Liddell patent in suit; and including secondary testimony of mechanisms alleged to be shown in a large number of blue-prints and photographs which are not in evidence in the case and the origin of which is not stated in the answer objected to; and including argumentative and far-fetched criticisms of the depositions of some of the defendant's experts; and including numerous statements about a particular paper bag machine which the witness states at the beginning of this answer that he has seen at some time in the past, without stating where he saw it, or when it was built, or where it is now, and without offering or proposing to offer it as evidence in the case; but which paper bag machine the witness is pleased to name the "Liddell Machine."]

[*Third. All the testimony in the answer to Q. 248 relevant to the so-called "Liddell Machine" is objected to as immaterial because it does not appear in that answer that that machine is in substantial conformity with the Liddell patent in suit; and because it does not appear in the answer that that machine was built by a mechanic of ordinary skill in the art of paper bag machinery with the aid of the specification and drawing of the Liddell patent in suit, No. 558969; and because it does not appear that whoever built the so-called "Liddell Machine" ever saw the Liddell patent No. 558969, or otherwise acquired any knowledge of the drawings or specifications of that patent; and because all the testimony in said answer relevant to said so-called "Liddell Machine" is inadmissible as a part of complainant's rebutting evidence even if some parts, or even if the whole of said testimony would have been admissible as a part of the complainant's evidence in chief.*]

[*Fourth. The nine thousand word answer to Q. 248 is compounded of a great variety of statements, arguments and inferences on a large number of topics, many of which appear to be outside of the personal knowledge of the witness, and all of which are connected so confusedly together that it is certainly difficult and probably impossible for any intellect to separate those statements into matters of fact known to the witness on the one hand, and matters of hearsay, inference, and argument on the other hand.*]

[*Defendant's counsel suggests to complainant's counsel that if this witness is supposed to know any fact or facts material to this suit, and proper to be proved on rebuttal, his testimony upon such fact or facts may properly be taken at this time; but that the witness ought to be told to confine his statements to the facts which are within his knowledge and which are enquired of in the questions put to him by counsel.*]

[*Defendant's counsel respectfully asks the Court to disregard the whole of the answer to Q. 248 for the reasons stated in the foregoing objection thereto.*]

[*Adjourned until Tuesday, November 10th, 1903, at 10:30 A. M.*]

Tuesday, November 10th, 1903.

[*Met pursuant to adjournment.*]

Present—Counsel as before.

[*Complainant's counsel referring to above statement of objections by defendant's counsel calls attention to and hereby renews his offer already made on the record to submit the operative machine made in accordance with the Liddell patent and described in the last answer by Mr. Dayton to the inspection of defendant's counsel and expert at any reasonable time, and on proper notice, so that arrangements can be made to operate the machine.*]

[*Defendant's counsel states that on Friday, November 6th, he gave notice on the record to complainant's counsel that he desired to have the machine specified in Q. 248 shown to defendant's counsel and defendant's expert in operation on Saturday, November 7th, at 2 o'clock in the afternoon; but that machine was not shown to defendant's counsel, or anyone representing the defendant at that time, or at any time heretofore.*]

[*Since defendant's counsel made that request on November 6th, the witness has given his long, nine thousand word answer to Q. 248, and that answer appears to defendant's counsel to show that the machine referred to therein is immaterial to all the issues of this suit. For this reason the defendant is not particularly interested in that machine, and the defendant's counsel does not think it worth his while to go anywhere to see that machine, and does not think it worth the while of any of defendant's experts to examine that machine, or pay any attention whatever to it, or to any drawings, photographs, blue-prints, or descriptions supposed to relate thereto.*]

[*Complainant's counsel now requests the notary public to write a suitable tag entitled in this case and also a suitable tag entitled in the suit against the Woodward & Rogers Company, on which shall be written the words "For identification Operative Machine of Liddell Patent in suit together with the present date, and notary's initials and seal," and complainant's counsel now requests the notary here present to proceed at 2 o'clock this afternoon to the place where said machine is lo-*

cated, viz.: on the second floor of No. 451 Washington street, corner of Washington and Watts streets, in New York City, and then and there affix said tags to said machine in as permanent a manner as possible by sealing the cord or otherwise, and in the presence of Mr. Albert H. Walker, defendant's counsel, if Mr. Walker choses to attend at that place and time, which he is hereby invited to do, but if Mr. Walker does not attend, the tags are to be affixed by the notary all the same.]

[*Complainant's counsel in this connection, and as a matter of record, hereby marks said machine for identification in this case, and in the Woodward & Rogers case referred to. Complainant's counsel states that of course the reason for not bringing the machine physically to the office of complainant's counsel and into the room where testimony is being taken is because of its large size and heavy weight which makes such procedure impossible.*]

[*Defendant's counsel requests the notary to carefully refrain from doing anything which the complainant's counsel requests him to do in the second paragraph above this paragraph. And defendant's counsel objects to all parts of the proposed proceeding on the following grounds:*]

[*First. The notary, when he reaches 451 Washington street, will have no means of knowing that any paper bag machine which he may find there is the same machine as the one referred to in the answer to Q. 248.*]

[*Second. It is improper to mark any machine or other exhibit for identification, except with a view to its being subsequently offered in evidence, and if the machine referred to in Q 248, or the machine referred to in the answer to Q 248, is to be offered in evidence in this case it ought to be offered in evidence now.*]

[*Third. The impossibility of bringing the machine to the office of complainant's counsel is no reason why it should not be produced and offered in evidence regularly before the notary public; because it is easy enough to adjourn the taking of the deposition to the place where the machine is, instead of continuing to take it in the office of complainant's counsel.*]

[*Defendant's counsel will take no part whatever in any such proceedings as that in which the complainant's counsel asks the notary to engage.*]

[*Complainant's counsel asks defendant's counsel if defendant's counsel ever offered in evidence the large machine alleged to illustrate defendant's operative or working machine in connection with this case, and which in defendant's record is mentioned under the title of "Walker Model-Room Machine."*]

[*Defendant's counsel states that he never did offer the "Walker Model-Room Machine" in evidence, and never requested that it be marked for identification. He simply proved its character by expert testimony and drawings, which testimony was taken and which drawings were put in evidence in the same office where the machine was, and which machine had then been repeatedly and carefully examined by several of complainant's counsel and several of complainant's experts, and which machine has been open to the examination of complainant's counsel and experts every day for nearly a year, and has been examined and re-examined by them over and over again by them many times.*]

[*Complainant's counsel requests Mr. Dayton, the expert, to accompany the notary public and to be present with him at 2 P. M. to-day at No. 451 Washington street, New York, and to point out to the notary public the actual machine about which Mr. Dayton has testified, and which is the machine the notary is requested to mark, and to see that the notary tags that specific machine as requested, and to be able on his, Mr. Dayton's, subsequent testimony, to testify on the record to that effect.*]

[*Defendant's counsel requests Mr. Dayton, the expert witness now on the stand, to carefully refrain from doing anything as specified in the above request of complainant's counsel, because so doing would constitute the giving of testimony in this case, in the absence of defendant's counsel, and at a place and time where no testimony in this case was being taken, it being very plain that the act of pointing out a machine to the notary public would constitute testimony that the machine thus pointed out is the same machine as that about which Mr. Dayton has testified.*]

[*Defendant's counsel earnestly objects to the preposterous proceedings in which complainant's counsel requests the notary and the witness to engage, and defendant's counsel sug-*

gests that if complainant's counsel really wants to get the machine in question into the case, he should adjourn the further taking of the deposition to the place where the machine is, and then regularly prove the machine, and offer it in evidence.]

[*Complainant's counsel says that there would be much inconvenience in taking testimony where the machine now is, and he does not consider it necessary on Mr. Dayton's direct, but if on the cross-examination of Mr. Dayton with reference to this machine defendant's counsel asks that such cross-examination be conducted in the presence of the machine, complainant's counsel will try to arrange such a method of procedure, although it, for many reasons, will be inconvenient so to do.*]

[*Defendant's counsel states that he does not intend to cross-examine the witness upon the machine referred to in his answer to Q. 248; because that machine appears to defendant's counsel to be so immaterial to the case that no cross-examination is necessary relevant thereto.*]

[*Complainant's counsel, in view of the character of the objections and statements made on the record by defendant's counsel, and in order to place distinctly and directly on defendants and their counsel the carrying out of the attitude suggested in regard to this Liddell Patent in suit, now and hereby cancels his request to the notary public to mark said machine for identification, as above set forth, and instead thereof requests the notary at the recess hour to adjourn the taking of testimony herein to proceed at 2 P. M. to-day at No. 451 Washington street, second floor, in the presence of the machine referred to, and for a sufficient length of time to enable complainant's counsel to offer said machine in evidence on the part of complainants in this case and to attach thereto proper tags in the presence of complainant's counsel and defendant's counsel if he chooses to attend, as he is hereby notified to do, and in the presence of complainant's expert, Mr. Dayton, who will then and there be asked in answer to a question to identify the machine so marked as the one about which he testified if such be the fact. The notary is requested to prepare himself to personally write out such record as may be necessary to be made on this occasion, in order to avoid the delay and trouble of taking*

a typewriter machine to the place referred to, and defendant's counsel is notified that after the offering in evidence of such machine, and the question and answer identifying it by Mr. Dayton, the testimony will forthwith be adjourned to proceed at the office of complainant's counsel, at the earliest hour this afternoon possible.]

[*Complainant's counsel offers in evidence the blue-print referred to by the witness, Dayton, in his last answer, as entitled "Liddell Paper Bag Machine Forming-Plate Operating Parts," and the same is marked "Complainant's Exhibit Drawing Liddell Forming-Plate Operating Parts, J. J. C., Notary Public, November 10th, 1903."*]

[*Defendant's counsel objects to the said blue-print because its origin, character, and significance have not been proved; and he particularly objects to designating it with the name of Mr. Liddell, because it does not appear that it has any connection with Mr. Liddell, and it does appear to be substantially out of conformity with the Liddell patent in suit, and substantially out of conformity with everything that Mr. Liddell appears in the record to have done.*]

[*Complainant's counsel offers in evidence another blue-print referred to by witness, Dayton, in his last answer, under the title of "Liddell Paper Bag Machine, Yoke and Slide Cams and Graduated Disc-Plates for Positioning the Forming-Plate Edge when marking Cams," and the same is marked in evidence as Complainant's Exhibit Drawing Liddell Cam Delineating Devices. J. J. C., Notary Public, Nov. 10, 1903.*

[*Defendant's counsel objects to the last mentioned blue-print, because its origin has not been proved at all and its character and significance have not been testified to by any person claiming to have taken any part in its production, and because its character and significance have not been proved intelligibly, and because it does not appear that Mr. Liddell ever had the slightest connection with the blue-print or anything represented thereby, and because everything represented by the blue-print is immaterial to this case.*]

[*Complainant's counsel offers in evidence the five photographs produced by the witness, Dayton, in connection with his*

last answer, and the same are marked in evidence respectively as "Complainant's Exhibit Liddell Machine Photo No. 1," "Complainant's Exhibit Liddell Machine Photo No 2," "Complainant's Exhibit Liddell Machine Photo No. 3," "Complainant's Exhibit Liddell Machine Photo No. 4," "Complainant's Exhibit Liddell Machine Photo No. 5," J. J. C., Notary Public, November 10th, 1903.]

[*Defendant's counsel objects to Photo. No. 1 because its origin has not been proved, and because it appears on its face to represent a very large and complicated paper bag machine, and does not appear on its face to show or to contain any such mechanism as is shown in the drawings of the Liddell Patent 558969, and because it does not show any such combination of mechanism as appears to be referred to in either of the claims of that patent.*]

[*Defendant's counsel objects to Photo No. 2 because its origin has not been proved, and because it does not appear on its face to represent any such combination as appears to be referred to in either of the claims of the Liddell Patent 558969.*]

[*Defendant's counsel objects to Photo No. 3 because its origin has not been proved, and because it does not appear on its face to represent any such combination of mechanism as is referred to in either of the claims of the Liddell patent 558,969, and particularly does not show any means for moving any pairs of fingers toward and from each other, and does not show any means for operating any forming-plate about its rear edge upon the surface of any cylinder.*]

[*Defendant's counsel objects to Photo No. 4, for the same reasons as those upon which the objection to Photo No. 3 are based.*]

[*Defendant's counsel objects to Photo No. 5 for the same reasons as those upon which the objection to Photo No. 3 are based, and for the additional reason that Photo No. 5 shows a unique and unprecedented Presser-plate to complete the folding of such a paper bag blank as that shown in Fig. 8 of the Liddell Patent 558,969, whereas that patent contains no drawing, description, or indication of any such instrumentality as that presser-plate.*]

[*Defendant's counsel objects to Photos Nos. 1, 2, 3, 4 and 5 because they do not appear to represent anything material to this case, and do not appear to represent any such combination of mechanism as if referred to in either of the claims of the Liddell Patent 558,969. And defendant's counsel particularly objects to those photographs being named with the name of Mr. Liddell, because it does not appear that he ever saw those photographs, or ever saw the machine which they represent, or ever took any direct or indirect part in the inventing or constructing of any combination of mechanism shown in those photographs; and particularly because it does appear that each of those photographs is destitute of any conformity to any combination described or referred to in any claim of the Liddell Patent 558,969.*]

[*Adjourned to No. 451 Washington street, Manhattan, New York, at 2 P. M., for the purposes stated by complainant's counsel.*]

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451 Washington Street, Manhattan, New York, 2 P. M.

[*Met after recess pursuant to adjournment.*]

Present—SAMUEL R. BETTS, Counsel for Complainant.
ALBERT H. WALKER, Counsel for Defendant.
JAMES J. COSGROVE, Notary Public, before whom the testimony is being taken.
M. E. DAYTON, Complainant's expert witness.

Q. 249. Please look at the paper bag machine now here present and open to the inspection of defendant's counsel, and state whether or not that is the paper bag machine about which you have testified in your preceding answer, viz.: that to Q. 248?

A. It is.

[*Complainant's counsel now offers in evidence the actual paper bag machine referred to and identified by the witness, and it is marked by the notary public as "Complainant's Exhibit Operative Machine of Liddell Patent in suit, J. J. C., Notary Public, November 10, 1903."*]

[*Complainant's counsel states that the marking is effected in the presence of defendant's counsel by fastening to said machine a tag entitled in this case and with the defendant's exhibit name thereon, and with the seal and initials of the notary, and the date referred to, said tag also containing the title of the suit of this complainant brought in the District of Connecticut against the Woodward & Rogers Company, so that the machine shall be an actual exhibit on the part of complainants in both these cases.*]

[*Defendant's counsel objects to the machine which has just been offered in evidence by the complainant's counsel on the following grounds:*]

[*First. The origin of the machine has not been proved except by the statement of the witness, Dayton, that William A. Lorenz had charge of the building thereof, but which statement does not appear to be founded on any knowledge of the witness, Dayton.*]

[*Second. Assuming that the machine was built by William A. Lorenz, or under his direction, its origin and character ought to be proved by him, and cannot be proved by the hearsay testimony of another witness.*]

[*Third. Assuming it to be proved that the machine was constructed by William A. Lorenz, or under his direction, it is objected to as the product of the most experienced and skillful paper bag machine expert in the whole world, and not as the product of a mechanic of ordinary ability in paper bag machinery.*]

[*Fourth. The machine offered in evidence contains no combination of parts in substantial conformity to the combination referred to in either of the claims of the Liddell Patent in suit, No. 558,969.*

[*Fifth. The machine offered in evidence is out of conformity with the testimony of the witness, Dayton, where, in his reply to Q. 248 he purports to describe the machine.*]

Sixth. The machine contains numerous mechanisms which have no resemblance whatever in construction, mode of operation, or function, to anything shown in the Liddell Patent No. 558969, upon which this suit is based.]

[*Seventh. The existence, construction, and mode of operation of the machine do not prove any fact which is in issue in this case, and therefore the machine is immaterial to all the issues of this case.*]

[*Defendant's counsel particularly objects to using the name of Mr. Liddell as a part of the name of the machine, because it does not appear that Mr. Liddell ever saw the machine, or ever knew of its existence, and it does not appear that he ever contributed anything directly or indirectly to its construction.*]

[*Complainant's counsel specifically objects to so much of above alleged objection to the exhibit as consists of statements of fact and of expert opinion on the part of defendant's counsel, such statements forming the greater part of said alleged objection, and they are objected to on the ground that defendant's counsel is not a witness in this case, nor qualified as an expert therein, is testifying out of defendant's time and not under oath, and not subject to cross-examination, and therefore complainant's counsel requests the Court to disregard said statements entirely.*]

[*Defendant's counsel states that all the facts specified in the objections interposed by him are apparent to whoever will thoroughly compare together the evidence already taken in the case with the machine just offered in evidence. Defendant's counsel has not stated any new fact in his objections, but only specified therein those facts already in the record upon which the objections are founded.*]

[*Complainant's counsel now offers said exhibit to the minute and prolonged inspection of defendant's counsel, if desired at the present time, and while arrangements have not been made to now operate the machine, again offers to have the machine operated before defendant's counsel and his clients and defendant's experts at any proper time on reasonable notice, for example, either Monday, Tuesday, Wednesday or Thursday of next week, if designated by defendant's counsel.*]

Q. 250. Please state whether you have, in the presence of Mr. Walker, operated the "Complainant's Exhibit Operative Machine of the Liddell Patent," and in what way and to what extent, and whether Mr. Walker was examining the machine during such operation?

A. I have turned the machine over by means of a hand-wheel while Mr. Walker appeared to be inspecting the somewhat obscured cams concerned in operating the side-fingers, and, I believe, with his request to do so. I think I have revolved the cylinder more than a full revolution while being thus specially inspected by him. The number of bags turned out unpasted demonstrates this extent of operation, the bags in the carrier previously formed by the machine in its last operation by power being pasted and the paste being now out of the machine.

[*Complainant's counsel now asks Mr. Walker, here present and standing within two feet of the machine, whether he desires Mr. Dayton to give the handle another revolution for the purposes of inspection.*]

[*Mr. Walker states to the Court that the last answer of Mr. Dayton is not in conformity with what occurred in this room on the occasion to which he refers, the fact being that Mr. Dayton began to turn the machine without request from anybody and was sharply ordered by complainant's counsel to stop doing so, and that thereupon he continued to turn the machine through one revolution, notwithstanding the repeated orders of Mr. Betts to stop, and without any request from anybody to turn it at all, and defendant's counsel states that he made no request to Mr. Dayton or to Mr. Betts relative to the machine, except that he asked Mr. Dayton to show where in the interior of the machine the cam and the spring could be seen which are supposed to operate one of the side fingers of the cylinder. Defendant's counsel regrets that he has no witness present to put on the stand to prove the truth of his statement, and he will pay no further attention whatever to anything that complainant's counsel or Mr. Dayton may say on the record or elsewhere relevant to the matter.*]

[*Now that the complainant's counsel and the complainant's expert have so studiously endeavored to make it appear in the record that the machine has been examined by defendant's counsel, notwithstanding the fact that complainant's counsel sharply ordered complainant's expert not to operate the machine at the time he did operate it, defendant's counsel requests that the machine be now operated a reasonable length of time in the*

presence of defendant's counsel, and that full opportunity be given to defendant's counsel to examine the parts of the machine which are not in plain view.]

Q. 251. Mr. Dayton, please state exactly the circumstances in regard to your starting the machine by the hand wheel and thereafter operating it by the hand wheel and in view of Mr. Walker's above statement?

A. I did first voluntarily operate the machine by hand, using up the pasted portion of the tube on the former left after a previous operation, forming complete bags by power, and stopped at the request of Mr. Betts. Later, and while Mr. Walker was carefully examining the parts connected with the cylinder, and in response to his inquiries as to certain of said parts, I pointed to them, and, perhaps at the request of Mr. Betts instead of Mr. Walker, further turned the crank and revolved the cylinder, Mr. Walker availing himself of this opportunity to observe the parts concerning which he had inquired. The turning of the machine this last time mentioned was to the extent of a full revolution of the cylinder, at least, because there were four bags turned out without the side seam being pasted.

[*Complainant's counsel states that a personal appointment made before it was contemplated coming up here at this time, makes it impossible for him to be present and have this inspection continued this afternoon. He further states that in view of the criticism of Mr. Walker to the effect that he was alone here and had no witness he could call to establish the truth of his (Mr. Walker's) observation if there was conflict of testimony or statement, makes it, in the opinion of complainant's counsel, very essential that Mr. Walker should have some such witness here, in order that the wrangling indulged in on the record may be stopped.*]

[*Complainant's counsel now offers inspection of this machine any time to-morrow to Mr. Walker, to his witness or witnesses, and asks him to designate the time.*]

[*Defendant's counsel demands an opportunity to examine this machine now, but he does not ask that anybody shall say anything while defendant's counsel is examining the machine.*]

[*Complainant's counsel accedes to that demand, on the proviso that defendant's counsel shall not in any way manipulate the machine.*]

[*Defendant's counsel states that the machine cannot be examined without turning its hand-wheel around so as to bring its several parts into view, and so as to see how those parts work together, and therefore the proviso is equivalent to a refusal of the request. The unreasonableness of the proviso must be known to complainant's counsel and must be obvious to everybody.*]

[*Complainant's counsel states that he is willing to have Mr. Dayton, complainant's expert, turn the handle in the presence of Mr. Walker for such observation, and to a reasonable extent.*]

[*Defendant's counsel requests the notary to note that having at last obtained permission to examine the machine, defendant's counsel begins doing so at two minutes before three P. M., on November 10, 1903.*]

[*Testimony adjourned until 10:30 A. M., to-morrow morning, November 11th, at the office of Betts, Betts, Sheffield & Betts, complainant's counsel, the testimony being that of complainant, and as Mr. Walker has stated that he desires to inspect the machine and has declined to state how long it will take him.*]

[*Defendant's counsel objects to any adjournment of the taking of testimony in this case until five o'clock P. M., to-day.*]

Wednesday, November 11th, 1903.

[*Met pursuant to adjournment.*]

Present—Counsel as before.

[*Mr. Walker states to the Court that at two minutes before three P. M., November 10, 1903, in pursuance of the last statement of complainant's counsel, Mr. Walker requested Mr. Dayton to turn the handle of the machine so that Mr. Walker could observe its parts in motion. At that time the machine was provided with paper running through it, so that the turning of the handle would result in the machine operating upon the paper to fold it into paper bag blanks of a diamond form, or at*

least would act as well as the machine could do that work. But Mr. Dayton, instead of turning the handle as requested, proposed to first remove the paper from the machine, so that it would have no paper to operate upon. Thereupon Mr. Walker objected to that removal, saying that he wanted to see how the machine would operate upon paper. Thereupon Mr. Dayton, without any request from anybody so to do and without stating any reason for doing so, tore the paper out of the machine so as to prevent Mr. Walker from seeing how it would operate with paper to work upon. Mr. Walker had no reason for examining the machine without paper in it, because he had thoroughly understood its construction (except in a single detail) for several days, being informed of that construction by an elaborate set of blue-prints which had been shown to him by Mr. Dayton last week; in connection with the fact that a considerable portion of the machine had been very familiar to Mr. Walker for more than sixteen years, being constructed in accordance with the Lorenz & Honiss patents, 321721 and 361951, the specifications of which were prepared by Mr. Walker himself prior to 1887. The single detail which Mr. Walker did not precisely understand before the machine was shown to him at all, was the cam and spring for operating each of the side fingers of the cylinder. That cam and spring were indicated to Mr. Walker by Mr. Dayton a few minutes before the machine was offered in evidence by complainant's counsel, so that the machine was fully understood by defendant's counsel, Mr. Walker, when he interposed his objection to the machine on the seven grounds stated in that objection.]

[For these reasons Mr. Walker went away immediately after Mr. Dayton tore the paper out of the machine, and almost exactly at three o'clock P. M. on November 10, 1903, and did not examine the machine at all after that time.]

[Defendant's counsel now requests that on some day to be selected by complainant's counsel, within a week from this time, the said so-called Liddell machine shall be operated by one or more of the complainant's experts, or other representatives, in the presence of defendant's counsel, in the same way that it was operated in the absence of defendant's counsel on November 5, 1903; and that thereupon the complainant's experts shall re-

move from the machine the flattening-plate which is shown in Complainant's Exhibit Photo No. 5 hovering over the paper bag blank below it, and shall thereupon operate the machine in the same way that it was operated on November 5, 1903, except in not employing that flattening-plate in that operation; and that the complainant shall carefully count and keep all the paper results of that operation, and put them in evidence in the case, so that the Court may know what the machine will do when operated by complainant's experts, without that flattening-plate.]

[*Defendant's counsel requests that he may be permitted to have a witness present with him during the requested operations of the machine, in order that he may hereafter prove the results of those operations in case the complainant omits to prove those results.*]

[*The foregoing request to repeat the operation of November 5, 1903, is based upon the fact that that operation was conducted ex-parte in the absence of everybody representing the defendant.*]

[*The foregoing request to repeat the operation of November 5, 1903, without using the flattening-plate is based upon the fact that no such thing is described, suggested, shown, or implied in the Liddell patent in suit, 558,969, and on the fact that that patent expressly states that the diamond-form (which in the so-called Liddell machine results from the use of that flattening-plate) will result according to the Liddell Patent from the side-forming fingers H H, the side-folding fingers G G, and the nipper c, and the finger-cap E', as shown in Figs. 5, 6, 7 and 8 of the Liddell patent.*]

[*Complainant's counsel objects to so much of the above statement as purports to be the statement of fact, or as purports to be expert statement as to the machine, on the part of Mr. Walker, on the ground that Mr. Walker is not a witness, has not been sworn, that it is not the time for defendant's testimony, that Mr. Walker is not subject to cross-examination, and, incidentally, that his statements of fact both personal and mechanical, are not correct in the opinion of complainant's counsel.*]

[*In answer to the request of defendant's counsel as to operating the machine complainant's counsel now fixes Monday, November 16th, at one P. M., or soon thereafter as is practicable, for the operation of the machine in the presence of defendant's counsel and expert, the intention being to start such operation at one P. M. Complainant's counsel, however, declines to stipulate in advance as to details of the manner of operation, any more than to say it will be practically and actually operated by power and upon paper to make bags, if defendant's counsel has any comments to make in view of or after such operation they can be put on the record. Complainant's counsel proposes to have his expert Mr. Dayton present at such operation and will question him as to what is done in his presence so as to make a proper record on which defendant's counsel can cross-examine him.*]

[*Defendant's counsel requests complainant's counsel to state now on the record whether the complainant will carefully count and keep all the paper results of the operation of the machine without the flattening-plate, and put those results in evidence in the case, so that the Court may know what the machine will do when operated by complainant's experts without that flattening-plate.*]

[*Complainant's counsel has no further answer to make, he will do as he decides, will offer in evidence what he desires, and will proceed with the operation of that machine at one P. M., next Monday, November 16th, at No. 451 Washington street, New York, in the presence of complainant's counsel and the expert, Mr. Dayton, and the notary public, and then and there take testimony about its operation, the session of one o'clock being an adjourned session of testimony to that time and the place 451 Washington street, New York, and defendant's counsel and his experts can attend or not as they see fit.*]

[*Defendant's counsel requests complainant's counsel to state now on the record whether he will permit the defendant's expert to carefully count and keep all the paper results of the operation of the machine without the flattening-plate, so that the defendant may put those results in evidence in the case in the event that the complainant decides not to do so.*]

[*Complainant's counsel has fully stated all he proposes to state. He desires to proceed with the testimony if possible.*]

[*The defendant's counsel requests the complainant's counsel at this time and on the record to accept or to reject those requests by the defendant's counsel which were made in paragraphs 3 and 4 of what defendant's counsel, Mr. Walker, inserted in the record immediately after the meeting this morning; and defendant's counsel states that the counter-proposal of complainant's counsel is not satisfactory to defendant's counsel because it does not include any repetition of the operation of November 5, 1903, and does not include any operation of the machine whatever without the flattening-plate, and includes no operation whatever except enough to amount to running the machine by power at any speed, however low, to make any paper bags, however few. The complainant's program, as stated in the counter-proposition, would be satisfied by running the machine with the flattening-plate at the rate of one bag a minute for two minutes, and therefore the complainant's counter-proposal is hereby rejected by the defendant's counsel.*]

[*Complainant's counsel will, as stated, adjourn the testimony on Monday morning to proceed at one P. M., at 451 Washington street, at which session the machine will be physically operated by power, and if defendant's counsel chooses to play blind-man's-buff in the matter he is at liberty to do so.*]

[*Defendant's counsel notifies complainant's counsel that he considers the last statement of complainant's counsel to be a rejection of the request of defendant's counsel made in paragraphs 3 and 4 of what Mr. Walker inserted in the record immediately after the meeting this morning, and defendant's counsel notifies complainant's counsel that nobody representing the defendant will be present at the useless operation proposed by the complainant's counsel in the last paragraph.*]

[*Complainant's counsel states that nevertheless the testimony will proceed at the time and place stated.*]

Q. 252. You have been present and heard the statements made on the record by Mr. Walker, defendant's counsel in regard to what happened immediately after the adjournment

of testimony taken at No. 451 Washington street, New York, yesterday in this case, and in fact you now have the record of statement before you, as you are under oath and a competent witness, please state to the Court the actual facts.

[*Defendant's counsel objects to this question, and to all other questions, on the ground that the witness is not under oath, no oath having been administered to him at any time by James J. Cosgrove, the notary public, whose name appears at the head of the so-called deposition, and no oath having been administered to the witness at any time by any body in this case during the last year; and the oath which was administered to the witness in this case on June 9th, 1902, by John A. Shields, United States Commissioner for the Southern District of New York, having no relevancy to any other deposition than the one which Mr. Shields took from this witness a year ago last summer.*]

Question withdrawn for the present.

[*Complainant's counsel desires it known that defendant's counsel, Mr. Walker, has been present throughout this entire rebuttal deposition of Mr. Dayton, and since the opening of the record on November 6, 1903, and has had page 1 of said record before him since it was taken down, and therefore must have had within his knowledge the facts on which he bases the exceedingly technical and late taken objections put on the record, and which on its face shows that Mr. Dayton has been testifying under oath in this case. However, as Mr. Walker has chosen to take such an objection, under such circumstances, complainant's counsel proposes to take no chances with such a practitioner, and now calls upon the notary here present, before whom the testimony is being taken, to administer a proper oath in this case to the witness, M. E. Dayton, including in the administration of that oath a statement by which the witness shall cover the testimony already taken on and since November 6th to and including this date, as to its truth or falsity.*]

[*Defendant's counsel hereby makes special objections to James J. Cosgrove acting as notary public to do anything whatever relevant to any testimony, or other evidence in this case,*

because he is a clerk in the office of complainant's counsel, and apparently subject to the will of complainant's counsel, and because the right to specially object to any notary public was reserved in the stipulation of March 11, 1902, which stipulation constitutes the only authority for any notary public to take any evidence in this case.]

[*Complainant's counsel asks defendant's counsel whether the objection just put on the record by defendant's counsel is intended by him to apply to the proceedings of the testimony already had in his presence and without objection or only to future proceedings?*]

[*Defendant's counsel states that if the present deposition can be closed at this point he is willing to waive the special objection to Mr. Cosgrove as to this deposition, and is willing to have Mr. Cosgrove administer an oath to the witness, and to have that oath retroact to cover this deposition; but that if another question is to be put to the witness before Mr. Cosgrove as notary public the objection will be insisted upon as applicable to the whole deposition.*]

[*Defendant's counsel gladly disavows any intention to reflect on Mr. Cosgrove in interposing the special objection to him, for he has neither done nor had occasion to do anything thus far in the case which indicated any bias, or partiality of action on his part.*]

[*And to oblige the complainant's counsel defendant's counsel is willing that the present deposition may go forward under the direction of Mr. Cosgrove, so far as to introduce in evidence whatever exhibits the complainant's counsel desires to introduce in connection with the statements already made by the witness.*]

[*Complainant's counsel states that while in his opinion Mr. Cosgrove as a notary public has full power to proceed with this deposition, it being taken for the U. S. Circuit Court in the District of Maine, yet Mr. Cosgrove was selected as the notary only for purposes of convenience, and on the supposition that his acting as such would be perfectly agreeable to Mr. Walker, Mr. Walker having selected his own notary to take defendant's testimony, and complainant's counsel having made no objection*

to that notary, defendant's testimony having in fact been taken down by defendant's own office typewriter, and without the presence of a notary except to swear witnesses. However, as Mr. Walker has seen fit to raise the point that Mr. Cosgrove is connected with complainant's office, and although it is the constant practice in taking testimony in patent cases to use a notary connected with the office of counsel who are taking the testimony, yet complainant's counsel as the objection has been made will acquiesce in the proposal of defendant's counsel, and now asks the notary to administer the oath so as to comply with the stipulation of defendant's counsel on the record.]

Mr. Walker has seen fit to raise the point that Mr. Cosgrove is

[*At the request of the complainant's counsel the notary certifies on the record that he has just administered to the witness Dayton, an oath in this case covering the testimony already given before the notary, and also any further question asked Mr. Dayton in connection with this particular deposition before the notary, and under the statement of defendant's counsel relating to closing up this particular deposition.*]

[*Complainant's counsel now offers in evidence the unassorted last hundred of the first run of two thousand bags referred to in the former answer of this witness as made from Lion paper, and on the front bag of which the witness has written "Lion paper. 1st run, November 5th-03, run of 2,000, speed 130 per minute. This is last 100 as they came from machine unassorted. 12 bags defective from total run of 2,000. M. E. Dayton." And the same is marked "Complainant's Exhibit Liddell Machine Lion Paper 100 bags. J. J. C., Notary Public. November 12th, 1903."*]

[*Complainant's counsel also offers in evidence the unassorted last hundred of the second run of 2,000 bags, referred to in the former answer of this witness as made from Buffalo paper, and on the front bag of which the witness has written "Buffalo Paper. 2nd Run of 2,000. Last 100 of run unassorted. 3% waste from 1900 (half of which should be passed). Rate of run, 133 per minute. Nov. 5-03." And the same is marked "Complainant's Exhibit Liddell Machine Buffalo Paper 100 bags, J. J. C., Notary Public, November 12, 1903."*]

[*Complainant's counsel also offers in evidence the last hundred of the third run of two thousand bags, referred to in the former answer of this witness as made from "Elephant Paper," and on the front bag of which the witness has written: "Last 100 — (minus) 1 waste out. 3rd Run of 2,000 Elephant Paper, 133 per minute or 17 waste of 2,000, Less than 1%. November 5.03. M. E. D." And the same is marked "Complainant's Exhibit Liddell Machine Elephant Paper 100 bags, J. J. C., Notary Public, November 12, 1903."*]

[*Complainant's counsel also offers in evidence the unassorted last hundred of the 4th run of 1,000 bags made from Elephant Paper at the rate of 1½0 to 1¼ per minute, spoken of by the witness in a former answer, and the other one of which is marked "November 5.03, 'Elephant,' Last 100 of 1,000 (final 4th) run at rate of 1½0 to 1¼ per minute. 17 waste = 1.7%. M. E. D." And the same is marked "Complainant's Exhibit Liddell Machine Elephant Paper 100 bags, highest speed, J. J. C., Notary Public, November 12th, 1903."*]

[*Complainant's counsel also offers in evidence all the bags which were selected out as defective in the four runs of the machine which made up the 7,000 paper bags referred to in the former answer of witness as the total product of said four runs, the said waste product being in four separate packages, the bags in each package being fastened together by cord passed through central holes in each, and the same are marked respectively as follows: "Complainant's Exhibit Waste of Lion Paper Run," "Complainant's Exhibit Elephant Paper Run," "Complainant's Exhibit Waste of Buffalo Paper Run," "Complainant's Exhibit Waste of Elephant Paper Run," "Complainant's Exhibit Waste of Elephant Paper Run at rate of 1½0 to 1¼ per minute," "J. J. C., Notary Public, November 12th 1903."*]

[*Defendant's counsel objects to all of the paper bags which have been offered in evidence by complainant's counsel on the following grounds:*]

[*First. All those bags are immaterial because they were made by means of a machine which is immaterial to all the issues of this case.*]

[*Second. All the said paper bags were manufactured in the absence of everybody representing the defendant, and the complainant's counsel has refused the request of defendant's counsel to repeat in the presence of defendant's counsel the operation of the machine by which those bags were made, and which refusal is recorded as the response of the complainant's counsel to the request contained in paragraphs 3 and 4 of the matter inserted in the record by Mr. Walker, the defendant's counsel, immediately after the meeting this morning.*]

[*Third. The bags offered in evidence avowedly constitute only a small fraction of the bags said by the witness, Dayton, to have been manufactured on the said machine at the time those bags were manufactured, and therefore constitute only a small fraction of the existing evidence of the work of that machine.*]

[*Complainant's counsel criticises the statement of defendant's counsel as incorrect where it attempts to state what complainant's counsel is alleged to have declined to do. Complainant's counsel gives notice that the operation of the Liddell Bag Machine in evidence at 1 P. M. next Monday, November 16, at 451 Washington street, New York, in connection with the testimony then and there to be taken will be the normal operation of said machine, and will be identical with its operation when the bags produced and offered in evidence were made in the presence of complainant's expert, Dayton, as specified by him.*]

[*Complainant's counsel requests Mr. Dayton in some way, if he has not already done so, to identify the packages containing all the other bags of the four runs referred to made on November 5th, 1903, so that if it is desirable or necessary they may be hereafter connected with the case or marked in evidence. Complainant's counsel does not want to burden the case with an enormous number of paper bags as exhibits, but will do so if it seems necessary for the record and for the instruction of the Court.*]

[*Defendant's counsel now requests that on Monday, November 16th, 1903, at two o'clock in the afternoon, or as soon thereafter as practicable, the complainant's expert shall remove from*

the so-called Liddell machine the flattening-plate which is shown in Complainant's Exhibit Photo No. 5 hovering over the paper bag below it, and shall thereupon operate the machine in the same way that it was operated on Nov. 5th, 1903, except in not employing that flattening-plate in that operation; and that, as the defendant's counsel may be permitted to be present at that operation with one or two of the defendant's experts, and that the defendant's counsel, or one of the defendant's experts shall be permitted to carefully count and keep all the paper results of that operation and afterwards to put them all in the case so that the Court may know what the machine will do when operated by the complainant's experts without that flattening-plate.]

[*Complainant's counsel asks defendant's counsel whether it is not a fact that the Claussen machines, as set up and operated at Rumford Falls, and which are proceeded against in this case, had flattening-plates or devices accomplishing the same purpose.*]

[*Defendant's counsel replies that the defendant's machines do here either a flattening-plate or a flattening-roller to do the same work that is done by the flattening-plate specified in the request of the defendant's counsel. And defendant's counsel adds that the defendant's machines cannot make any paper bags commercially, if at all, without such a flattening-plate or flattening-roller, though the flattening-plate may be a stationary one in the defendant's machine instead of being an oscillating one as in the so-called Liddell machine, and defendant's counsel adds that such a flattening-plate is shown in the Claussen Patent 598,497, under which the defendant's machines were built, though no such instrumentality nor anything performing its function is shown in the Liddell patent upon which the suit is based.*]

[*Complainant's counsel asks defendant's counsel if in connection with his last statement he will not admit that flattening-plates or devices were old in the art in connection with paper bag machinery prior to the date when the Liddell application was filed?*]

[*Defendant's counsel replies that the first flattening-plate,*

such as is inquired of, which existed in the prior art is shown in the Leinbach, Wolle & Brunner Patent 327,280, of September 29, 1885, and that the next one is shown in the Lorenz and Honiss Patent 331,722 of December 1st, 1885. And that another flattening-plate is shown in the Lorenz & Claussen Patent 410,841, of September 10th, 1889. But that no flattening-plate substantially like that of the so-called Liddell machine and shown hovering over the bag blank in Complainant's Exhibit Photo No. 5 is to be found in any part of the art prior to the year 1903, that flattening-plate having as defendant's counsel understands together with its moving mechanism been invented by William A. Lorenz since January 1st, 1903, as an indispensable addition to the rest of the so-called Liddell machines, without which addition or its equivalent that machine cannot, in the opinion of defendant's counsel, make any merchantable paper bags whatever.]

[*Complainant's counsel says he has no further answer to make than above made to defendant's specific request as to operation of the Liddell machine at or after two P. M., than has been covered by his former statement that the machine will be operated as it was on November 5th, and in its former manner of operation.*]

[*Defendant's counsel now requests that on Monday, November 16th, 1903, at two o'clock in the afternoon, or as soon thereafter as practicable, the so-called Liddell machine shall be turned over to defendant's counsel to be operated by one or two of the defendant's experts in the presence of counsel on both sides with the flattening-plate (which is shown in Complainant's Exhibit Photo No. 5, hovering over the paper bag below it) absent from the machine, so that the defendant's counsel can in due time regularly prove what that machine will do without that plate. Defendant's counsel states that if complainant's counsel will grant this permission defendant's counsel will be personally responsible for all parts of the machine during the time it is turned over to his control, and at the end of that short time will replace the flattening-plate in exactly the position it may have when the machine is turned over to him for trial...Furthermore, if complainant's counsel is un-*

willing to allow the plate to be removed and replaced by the defendant's expert, Mr. Smith, or the defendant's expert, Mr. Stone; the defendant's counsel will, with the consent of the complainant's counsel, employ the complainant's own present expert, William A. Lorenz, to remove the flattening-plate and to run the machine without the flattening-plate, and to replace the flattening-plate so that nobody except Mr. Lorenz need touch the machine during the time of its trial without the flattening-plate.]

[*Complainant's counsel answers that so far as submitting the Liddell machine in question to the tender mercies of defendant's experts, Stone and Smith, he has not gained that amount of confidence from reading and hearing their depositions in this case that would justify him in entrusting a paper bag machine of any kind to their operative care he can best answer this branch of the question by quoting a pertinent expression from the opinion of his Honor Judge Coxe in the case of Rynaer vs. Evans, 83 Fed. Rep., p. 697. "An experience of fourteen years in patent litigation has convinced the Court that when an expert undertakes to prove his adversary's process or machine is a failure he always scores a success." To avoid disappointment on November 16 on the part of defendant's counsel, complainant's counsel states that he will not now give any assurance of doing on that day what defendant's counsel requests.*]

[*Defendant's counsel now requests the complainant's counsel to state on the record without evasion whether he will now give the defendant's counsel assurance that he will ever at any time, or at any place allow anybody to run the so-called Liddell machine in an effort to make paper bags with that machine in the absence therefrom of the flattening-plate which is shown hovering over a paper bag blank below it in Complainant's Exhibit Photo No. 5, and on this point defendant's counsel states that he is willing that the machine be thus tried by any one or more of the complainant's experts, or by any man, woman, or child that the complainant may select for the purpose, and the defendant's counsel agrees beforehand and now to abide by the result of that trial, whatever it may be the*

same as if it had been conducted by the defendant's experts. The defendant's counsel has no particular choice as to the time or place of the requested trial, and attaches no condition whatever thereto except that it may be had by somebody at some time or place in the presence of defendant's counsel and that its result may be put in evidence whatever that result may be.]

[*Complainant's counsel suggests that he is not under cross-examination, but will give the request of defendant's counsel due consideration.*]

[*Defendant's counsel requests complainant's counsel to state now on the record whether he will at some time in the future announce to defendant's counsel the result of the consideration which he promises to give to the request of defendant's counsel, and if so, about how soon that announcement may be expected.*]

[*Complainant's counsel has nothing to add.*]

[*Complainant's counsel announces that the direct-examination of this deposition before James J. Cosgrove, is closed.*]

[*Defendant's counsel, for special reasons, declines to cross-examine the witness in this deposition.*]

(Sgnd.) MELVILLE E. DAYTON.

Before me.

(Sgnd.) James J. Cosgrove,
Notary Public,
County of New York.

[SEAL.]

Southern District of New York,
United States of America, } ss.:

I, James J. Cosgrove, a notary public, for the County of New York, State of New York, duly authorized to administer oaths and take and to certify depositions, do hereby certify as follows:

That Melville E. Dayton, the witness who gave the foregoing deposition, was by me duly sworn to testify the truth, the whole truth and nothing but the truth; that his said deposition was reduced to typewriting by Miss Virginia L. Thornton, in the presence of said witness, and under my supervision and by consent of counsel, and when completed, read over by said witness, and thereafter subscribed to by him in my presence and in the presence of counsel for the respective parties; that said deposition was taken pursuant to notice and agreement of counsel at the office of Betts, Betts, Sheffield & Betts, at No. 120 Broadway, New York City, beginning on the 6th day of November and continued as noted in said deposition by successive adjournments to and including November 11, 1903, except that a portion of the deposition taken on November 10th, was taken at No. 451 Washington street, City of New York, Borough of Manhattan, which portion, by consent of counsel, was there taken stenographically by Mr. W. S. Jones, in the presence of counsel, and thereafter taken down on the typewriter by Miss Thornton from his dictation; that the parties were represented at the taking of said deposition by their respective counsel, as set forth in said deposition; that the said witness lives at a greater distance than one hundred miles from the place of trial of this suit; that the several exhibits recited in the said deposition were offered in evidence and marked by me as specifically noted in said deposition; and I further certify that I am not of counsel or connected with either of the parties to said suit; or otherwise interested in the event thereof.

In testimony whereof I have hereunto set my hand and official seal this 12th day of November, 1903.

[SEAL.] JAMES J. COSGROVE,
Notary Public,
New York County

New York, November 12, 1903.

Evidence taken on behalf of the complainant in rebuttal, before Arthur Brenton Cook, a notary public, having authority to act as such in Manhattan, New York, and being taken down by Virginia L. Thornton, a typewriter operator, and being thus taken before said notary public by said typewriter operator, in pursuance of the stipulation of the parties which is prefixed to the complainant's evidence and which was made March 6th, 1902; said evidence being taken at the office of Betts, Betts, Sheffield & Betts, at 120 Broadway, Manhattan, New York, beginning on Thursday, November 12, 1903, at 11 o'clock in the forenoon and continuing thereafter from time to time.

Present—The Notary Public, Arthur Brenton Cook, Samuel R. Betts, Counsel for Complainant; Albert H. Walker, Counsel for Defendant.

Melville E. Dayton, a witness produced on the part of complainant for the giving of further testimony herein, and having been first duly sworn by the notary public in the presence of counsel as above noted, to testify the truth, the whole truth and nothing but the truth, testifies as follows:

Q. 253. Mr. Dayton, you were present and heard the statements made on the record of testimony taken before James J. Cosgrove, Notary Public, yesterday, Wednesday, November 11th, in regard to what happened immediately after the adjournment of testimony taken at No. 451 Washington street, New York City, upon Tuesday, November 10th, in this case. Please refresh your memory by said record if necessary, and please as briefly as possible state any points in which your recollection of the circumstances may differ from that put on the record bydefendant's counsel.

[*Defendant's counsel requests complainant's counsel to precisely specify which statements in the record of the testimony taken before James J. Cosgrove is referred to by the present question, and to make that specification so clear that there never can be any doubt in respect to what statement is referred to.*]

[*Complainant's counsel considers this question perfectly definite and clear, but he does refer to the first and second paragraphs put on the record by Mr. Walker, and immediately on the opening of the session on Wednesday, Nov. 11th, 1903.*] 5

A. There are only two parts of Mr. Walker's statement, referred to in the question, which seem to me to call for comment on my part, the historical facts being correctly stated by Mr. Walker. The first part of Mr. Walker's statement calling for comment is found in the second sentence of the first paragraph of his said statement, wherein he says:

> "At that time the machine was provided with paper "running through it, so that the turning of the handle "would result in the machine operating upon the paper to "fold it into paper bag blanks of a diamond form, or at "least would act as well as the machine could do that "work." 57

If Mr. Walker had reflected (assuming him to have the knowledge which he claims to have had in the same paragraph of his statement "for more than sixteen years") he would have known that the latter portion of his above quoted statement was not true. There was, indeed, paper in the machine, by which he meant and I mean, paper on the tube-former entering between the drag-rolls and feed-rolls on its way to the diamond-forming devices. But this paper was not in proper form to be successfully or properly passed through the diamond-forming mechanisms for the following reasons: First. The former operates under pneumatic suction requiring power to produce the suction and to draw the paper properly about the former to give the desired accuracy of shape to the tube, and there was no power acting at that time upon the suction devices, and the paper was not being properly shaped upon the former, as it seemed to me. Secondly. The proper operation of the diamond-forming devices calls for a paper tube which is not only properly shaped by the former, but which has it overlapping edges properly pasted together, so that they adhere during the diamond-forming operation. There was no paste in the machine, and consequently the paste- 57

applying devices were not supplying paste to the seam of the tube, and no seam was being made in the tube. It follows that the paper was reaching the diamond-forming devices in no fit shape for "the machine operating upon the paper to fold it into paper bag blanks of a diamond form * * * as well as the machine could do that work," or well enough to prudently permit running the machine further in that condition of incompleteness of the tube.

The second portion of Mr. Walker's statement calling for comment, is also in the first paragraph, reading as follows:

> "Thereupon Mr. Dayton, without any request from any-
> "body so to do and without stating any reason for doing
> "so, tore the paper out of the machine so as to prevent
> "Mr. Walker from seeing how it would operate with paper
> "to work upon."

Mr. Walker was not in a position to state whether or not I had been requested to sever the tube (which is what I did), and, in fact, I was requested by Mr. Betts to cut off the paper. This being after adjournment, I had spoken to Mr. Betts about the conditions as to the incompleteness of the tube, and advised him that in my judgment the machine should not be further operated upon paper under these conditions, and he directed me to run it only without paper for Mr. Walker's inspection at that time. I accordingly tore the paper across back of the drag-rolls by which it is taken from the former, whereupon Mr. Walker declined to further inspect the machine, and withdrew as he states, the minute of leaving being somewhat later than he states, however, though that is immaterial.

Q. 254. Please look at the blue-print now shown you and bearing upon it four illustrative figures numbered Fig. 1, Fig. 2, Fig. 3 and Fig. 4, respectively, and also having upon it the blue-printed title "Liddell Paper Bag Machine Perspective Drawings of the Forming-Plate and Co-Operating Parts Opening out a Diamond," and state if you know what that blue-print and those figures represent, and if so set forth what they do represent, and give any explanation in connection with said drawing which may be helpful to the court in considering this case, in your opinion?

A. The blue-print referred to in question illustrates with substantial accuracy the various successive steps and positions performed and taken by the diamond-forming-plate E of the Liddell Patent, as embodied in "Complainant's Exhibit Operative Machine of Liddell Patent in suit." Fig. 1 shows the forming-plate E in its starting position, this being the position in which the paper bag blank is received beneath it and above the subjacent cylinder C.

As will be seen by reference to Complainant's Exhibits Liddell Machine Photo Nos. 1 to 5, said machine has on the cam shaft a disc bearing graduations into 36 parts of the circle, said graduations being more distinctly observable in Photos Nos. 2, 3, 4 and 5. I will state that this disc bears on its opposite side the yoke-cam K'. A fixed pointer is seen in said photos opposite the right hand side of the graduated cam-disc in various positions in the different photos. Photo No. 2 shows the pointer opposite 36-0 and the cam disc, and Fig. 1 of the blue-print now being described shows all the parts of the forming-plate and the forming fingers in the positions they occupy when the pointer is opposite 36-0, as in said Photo No. 2. In order that none of these parts shall be hidden in the blue-print the cam I is shown in dotted lines only, but in proper position to illustrate its action upon the cam-arm H^2 connected with and operating the forming-plate side fingers H H.

In Fig. 2 of the blue-print the cam I is also shown in dotted lines, or as if transparent, and the various parts concerned in opening the end of the tube into a diamond form are in this figure illustrated in about the position the parts assume when the cam disc has been turned to bring the graduation 6 opposite the pointer.

Fig. 3, also having the cam I shown in dotted lines or transparent, shows the diamond-forming devices in the position they have reached when the graduated disc is moved to bring the number 11 thereon about opposite the pointer.

Fig. 4 of the blue-print shows the forming-plate moved to about its extreme advanced or right hand position, and the paper folded to the diamond form but not yet flattened to

sharpen its folding lines. The retraction of the forming-plate E has not yet commenced in this figure, and the side fingers G G, H H, belonging respectively to the cylinder C and the forming-plate E, are not yet withdrawn. This is the position the parts have reached when the graduated disc has its numeral 15 opposite the pointer.

The cam I is shown in its proper relative position in all these figures, with the effect of illustrating the action thereof upon the finger H^2, belonging to the fingers H H; and the transparency of the cam I, as shown by dotted lines, permits the action of the cam on the arm H^2 to be shown as well when it is passing along the inside surface of said cam (see Figs. 2 and 3) as when striking the front or rear ends of said cam (see Figs. 1 and 4).

[*Complainant's counsel offers in evidence the blue-print referred to by the witness in his last answer, and the same is marked "Complainant's Exhibit Drawing Liddell Machine Parts Opening Diamond."*]

[*Defendant's counsel objects to the blue-print just offered in evidence, because the so-called Liddell machine (a small portion of which the blue-print purports to delineate) is immaterial to all the issues of this suit; and because Fig. 4 of said blue-print is out of conformity with said Liddell machine in that it omits the flattening-plate which is shown in Complainant's Photo No. 5, hovering over the paper bag blank below it, and which flattening-plate is indispensable to the completion of the diamond form of the paper bag blank in the so-called Liddell machine.*]

[*Recess.*]

Q. 255. Referring to your answer to Q. 248 and to the portion thereof found on typewritten pages 41, at the bottom, and 42 thereof, where you speak of two parts as being added to the Liddell machine and not shown in the Liddell patent, one being a guide-plate and the other being a wiper-plate, flattening-plate or ironing-plate as it is variously called, you say, "such flattening devices are common in various forms and variously mounted," putting your statement in the present tense. I de-

WRITING CLOSE TO EDGE

sire you now to state, as you did not do in that particular portion of your answer, whether or not such flattening devices as you have referred to were or were not prior to the date of the filing of application for the Liddell patent in suit, "common in various forms and variously mounted."

[*Defendant objects to this question on the following grounds:*]

[*First. It is flagrantly leading.*]

[*Second. It is an attempt to induce the witness to materially change his former deposition which was taken before James J. Cosgrove, notary public, and the necessity for which change would appear to have been made known to complainant's counsel after the witness answered the last question in that deposition, and to have been thus made known by the information which the defendant's counsel gave to the complainant's counsel in pursuance of two inquiries made by complainant's counsel and inserted in the record ten or twelve paragraphs backward from the end of the record of the said deposition taken before James J. Cosgrove.*]

[*At this point the defendant's counsel takes the same course in respect of the witness Dayton that the complainant's counsel took in respect of the defendant's witness Liddell, as follows:*]

[*The defendant's counsel requests the witness Dayton to totally abstain from consultation or conversation with every other person relevant to whatever he understands to be involved in the present case, until after the present deposition is completed and signed by him.*]

[*In case the witness will not conform to this request; the defendant's counsel requests him to keep a record in writing of every consultation that he may engage in with any person relevant to whatever he understands to be involved in the present case until after the present deposition is completed and signed by him, and that that record shall particularly state the names of all persons with whom he is holding such consultations from time to time, and the days on which such consultations are held, and the length of time covered by such*

conversations respectively, and the points attended to in such consultations.]

[*The defendant's counsel also requests the witness to abstain from reading over any part of his deposition until after the whole is completed, precisely as the complainant's counsel requested the defendant's witness, Liddell, to abstain from reading over any part of his deposition until after it was completed.*]

[*The defendant's counsel also requests the witness Dayton to refrain from making any change whatever in any sheet of his deposition until after it is completed, and then to make no change whatever on the face of the deposition, but only by way of separate amendments indicated at the bottom thereof.*]

[*Defendant's counsel notifies complainant's counsel and witness that the witness will be asked on cross-examination whether he has conformed to these requests of defendant's counsel, and if it shall appear on cross-examination that he has omitted to conform to them all, he will thereupon be cross-examined in respect of the matters in which he has thus omitted to conform.*]

[*Defendant's counsel states to the court that he himself never knew of such request being made to a witness, except the similar requests which were made by complainant's counsel to the witness Liddell, and all of which were scrupulously observed by that witness.*]

[*Defendant's counsel submits to the court that it is not unfair to apply the same plan to the witness Dayton that was applied to the witness Liddell, for the purpose of making sure that the deposition of the witness shall be made to embody his testimony unchanged and unaffected by consultation with other persons while the testimony is being given; and also to make sure that the witness shall not change his testimony from time to time in order to make it hang together and be more consistent than it otherwise might be.*]

[*Complainant's counsel states that he will not pay the slightest attention whatever to the above requests made by de-*

fendant's counsel in respect to the taking of testimony herein, and hereby instructs the witness, Dayton, that he need pay no attention whatever to said requests, except the request that said witness, Dayton, refrain from making any change whatever in any sheet of his deposition until the end of each answer he may give, when witness is requested to read his answer over and point out any changes he may desire to make, either merely mechanical corrections of typewriting errors, or otherwise, and when the notary will thereupon be requested to rule as to whether such suggested changes are merely mechanical and to be made in the body of the deposition to prevent idiotic confusion, or whether they relate to matters of substance, in which case complainant's counsel desires they shall be noted at the end of his answer.]

[*Defendant's counsel requests complainant's counsel to state on the record why he thinks the same restriction which he insisted on with success in the Liddell deposition should not be applied to the Dayton deposition.*]

[*Complainant's counsel proposes to cut short this lumbering up of the record in Walkerian style, and proceeds to ask a question of the witness.*]

[*Defendant's counsel now moves the notary public before whom the deposition is being taken, to instruct the witness to disregard the instruction which complainant's counsel has presumed to insert in the record; which motion is based upon the jurisdiction of the notary to regulate the taking of the deposition and is based upon the fact that the requests of defendant's counsel were addressed to the witness, and were not addressed to complainant's counsel, and upon the proposition that it is for the witness to decide for himself which of those requests he will comply with, and which of them he will disregard.*]

[*Complainant's counsel absolutely denies that there is any authority in the notary public which extends beyond the regulating of the taking down of testimony in his presence. To dictate to complainant's counsel how he shall conduct his case outside the actual period of taking testimony is entirely beyond any powers conferred upon an examiner and notary public under the rules or the statutes.*]

[*The notary states that he does not consider that he has the power to instruct the witness to disregard the instruction given by complainant's counsel; and in regard to the requests of defendant's counsel being addressed to the witness, and not to complainant's counsel, the notary considers that the complainant's counsel has the same right of objection to the requests made by defendant's counsel that he would have to questions put by defendant's counsel to the witness.*]

A. Such flattening devices as I referred to in my answer to Q. 248 were common in various forms and variously mounted, prior to the date of the filing of the application for the Liddell patent in suit.

[*Answer objected to as not specifying any patent or any place or any time prior to the date of the application for the patent in suit when and where any such flattening device existed, and defendant's counsel submits to the court that the general testimony that a particular type of device existed prior to February 6, 1898 (which is the date of the application for the Liddell Patent in suit), is totally incompetent, because any witness could swear to such a point whether he knew it to be true or not, without leaving any means of contradicting him in case it were false.*]

Q. 256. I find that defendant's principal expert witness, Wilbur M. Stone, in the course of his answer to Q. 11 upon defendant's testimony herein, and specifically referring to the portion of that answer which is found in defendant's printed record of testimony, pp. 188, 189 and 190, specifies in detail six particulars in which he says: "A machine built according to the drawings and specifications of the Liddell Patent, would be inefficient to properly produce a perfectly formed square bottomed paper bag, from a tucked paper tube," * * *

Please consider Mr. Stone's six particulars of alleged inefficiency, as stated by him, and inform the court whether, in your opinion, they or any of them are applicable to the operative machine marked in this case as "Complainant's Exhibit Operative Machine of Liddell Patent in suit," and about which you have testified in your deposition.

[*Objected to as immaterial, because the so-called Liddell machine is out of conformity with the Liddell patent in so many and so important respects that its faults or virtues, whatever they may be, are immaterial.*]

A. In the first place, the Liddell invention described and shown in specifications and drawings of the Liddell patent in suit does not propose to "produce a perfectly formed square bottomed paper bag, from a tucked paper tube," but merely proposes, as Mr. Stone has himself elsewhere fully recognized, mechanisms for the production of the *diamond upon a tucked* paper tube, as a step towards the formation of a complete square bottom on such a tubular blank. The six particulars in which Mr. Stone alleges the Liddell patent to be deficient all relate to the mechanisms concerned, more or less directly, in producing this diamond-form on the tube.

The first specified particular of defectiveness or inefficiency relates to the cams K and K′, which Mr. Stone says are not shown and described in the patent "of the proper profile," and the gears M′ and N with their intermediate gears M M connected with the forming-plate which Mr. Stone says are not of the proper proportion. His exact words are that the gears M′ and N are not "of the proper ratio." This objection is to the effect that the drawings of the Liddell patent are not working drawings, or what the machinist would call "construction drawings." And this is true. The specification, however, amply sets forth what is to be accomplished by these cams and gears, while the drawing shows adequately their positions and relations in the machine. Complainant's Exhibit, Operative Machine of Liddell Patent in suit, has been made in accordance with the Liddell Patent as to the situations of said cams and gears, and with intelligent judgment and skill in making the cams of such contour and the gears of such proportion that they successfully carry out the purposes attributed to them in the specification and give the result named in the patent. Mr. Stone's first criticism therefore does not apply to said Liddell machine, but only to the illustrative drawing Fig. 1 of the patent. And so far as said first criticism of Mr. Stone is intended if at all, to give to the court the impression that said Lid-

dell patent describes an inoperative machine, such criticism is refuted by said actual Liddell machine, Complainant's Exhibit Operative Machine of Liddell Patent in suit.

The second of the six specified criticisms made by Mr. Stone is to the effect that "There are no means provided for holding the roll in the inward end of the plunger *k* against the periphery of the cam K", and that the result will be "to crush the top of the tucker-plate E, arms h h and links H' against the surface of the cylinder and break it." This is in effect saying that the patent fails to show in the drawing either the customary spring for holding the cam-roll against the edge of the cam (indicated as an edge cam), such as the spring F' shown in the same drawing for holding the end of the arm F' against the other cam K' or the alternative device familiar to machinists and consisting in providing the cam with a groove in which the roll shall run, with the same effect. It is true that the patent drawing does not show either the spring (in connection with this particular roll and cam), or the equivalent cam groove. In the actual Liddell machine referred to the constructor has chosen to make the cam as a grooved or box cam, the groove taking in the roll on the slide *k* and thus holding the roll to its proper course throughout the entire revolution of the cam. A spring attached to the slide *k*, such as that shown at F' in the same figure of the patent drawing, would have accomplished precisely the same result. The actual machine, therefore, presents no such difficulty as the crushing in of the cylinder predicted or alleged by Mr. Stone, and, in so far as Mr. Stone in his second specification may have led the court to believe the machine of the Liddell patent inoperative, the actual machine of "Exhibit Operative Machine of Liddell Patent in suit" will correct that impression, and the said second criticism of Mr. Stone has no applicability to said actual machine whatever.

The third specification of deficiency, or inefficiency, in the Liddell patent drawings and specification is that "There is no provision in the Liddell patent for the return of the arm H² to the position shown in Fig. 2 after the completion of its forward stroke over the face of the cam". He says that "After

completing this stroke [the forward stroke] said arm H^2 will drop off the end of said cam, near the character F in Figure 2", and that "Said arm H^2 in starting on its return movement will promptly collide with the rear end of cam I. Also as said arm H^2 is then held by the spring J, against the stop J', said arm is not free to fall back any further, but will be stopped in its return movement, and the machine rendered inoperative."

I have had occasion to consider this third criticism of the Liddell patent by Mr. Stone in a former answer, and there pointed out that he is entirely wrong, crediting him with having inadvertently overlooked the fact that the arm H^2, owing to the reversal of the direction of the forming-plate as it proceeds towards its most advanced position, strikes the cam I with the stop J' in the same relation to the arm H^2 that it occupies when the forming-plate is started forwardly from its initial position. I here point out that this fact is particularly and plainly illustrated in Complainant's blue-print Exhibit "Drawing Liddell Machine Parts Opening Diamond," which illustrates the construction and operation contemplated in the patent and embodied in Complainant's Exhibit "Operative Machine of Liddell Patent in Suit." I will add that Mr. Stone should also have seen that the forming-plate may be brought back in a course wherein the arm H^2 will pass entirely above the cam I, and that, consequently, there was no basis whatever for his said third criticism. The actual machine completely refutes the alleged defect of the patent in this particular, and said third criticism does not in any degree apply to said actual machine.

The fourth specification of inefficiency charged by Mr. Stone against the Liddell patent is that the gears on one of the arms F, though they will, "if of first-class construction" "probably operate to transmit motion from the cam K to the forming-plate E," will nevertheless, by constant use, "soon develop so much back-lash as to cause the action of the forming-plate E to be inaccurate." This is at most charging that the machine is subject to wear by use. Concerning this matter several things may be said. First, that it is true every machine, after a long use, shows wear. But, second, such wear

is not rapid in a well-made machine in which proper materials are used; and, third, absolute accuracy, or complete absence of back-lash in the gears referred to is not essential to successful operation of the machine. Besides, fourth, the machine contains its own means for the remedy of objectionable back-lash, when in the course of time it shall occur, owing to the fact that only about a third of the teeth on the said gears are brought into action in the cycle of movements of the arms F and forming-plate E. Wherefore, when the teeth actually engaged shall have become worn, the several gears may be shifted on their several axes to bring a new set of teeth into use, and when these shall at last be worn badly, the gears may be again shifted and another set of their teeth, previously not used at all, brought into service. Finally, when all the teeth shall become objectionably worn, new gears throughout may be substituted.

But the contention that a machine or part of a machine, admittedly capable of original operation, is inefficient because it is liable to wear from use, strikes me as the acme of hypercriticism, and in this case appears to show excessive eagerness to find fault with the Liddell Patent.

In this connection I cannot refrain from calling the attention of the court to the discussion of back-lash in my cross-examination in the Woodward & Rogers Company case, beginning about page 237 of complainant's printed record, and particularly to the allegation of the admittedly learned counsel for defendant who, in x-Q. 193, and on page 243 thereof, announces to the court as a settled scientific fact in the science of gear teeth, that the "allowance for back-lash *in fine work* is 1/16 of the length of the teeth, so that, if two gears having teeth an inch long mesh together in fine work, the back-lash between those two gears will be 1/16 of an inch." And in connection with this statement of defendant's counsel I call attention to the testimony of his own witness, the expert Mr. Wilbur M. Stone, who says, as above quoted from his fourth count of indictment, that "if of first-class construction the gears on arm F would probably operate to transmit motion from the cam K to the forming-plate E," and who also says, in answer to x-Q. 125,

on page 283 of defendant's printed record, that "Undoubtedly, when such gears were new," it is quite practicable to avoid such back-lash as would make it impracticable for such a train of gears to impart the proper motion to the plate.

[*Complainant's counsel has been able to arrange to proceed certainly up to recess to-morrow without asking further adjournment than the ordinary adjournment over night, and may be able to arrange to proceed through the entire day's session of to-morrow, but will not be able to proceed with this deposition on Saturday, November 14th, and now gives notice to that effect to defendant's counsel, so that no surprise can be claimed.*]

[*Defendant's counsel objects to any adjournment of the present deposition to cover any portion of Friday, or to cover Saturday or any portion thereof, and requests that the taking of the deposition shall go forward all day Friday, and all day Saturday, throughout the business hours of those two days, from 10.30 A. M. to 5 P. M. respectively, and the defendant's counsel requests the notary to rule now upon the question whether the taking of the present deposition shall be adjourned over from Friday until Monday on the one hand, or whether it shall be adjourned from Friday until Saturday on the other hand; and on that point defendant's counsel informs the notary that the defendant's testimony in chief in this case was closed, as appears by the record, early in May, 1903, which is now six months ago, and that during the intervening six months the complainant has taken the deposition of only one witness prior to the deposition of the present witness. And defendant's counsel also informs the notary of the fact well known to counsel on both sides, namely, that the taking of complainant's testimony in rebuttal has been postponed at the request of the complainant's counsel many different times during the last six months.*]

[*The notary reserves his ruling upon the question of an adjournment during a portion of Friday, until it is determined whether such an adjournment is definitely requested, but considers that under the circumstances it is reasonable to*

grant an adjournment over Saturday until Monday, November 16; it being his understanding that it is the intention of counsel upon both sides to proceed with due diligence in the taking of testimony.]

[*Adjourned until Friday, November 13, 1903,* at *10.30 A. M.*]

Friday, November 13, 1903.

[*Met pursuant to adjournment.*]

Present—The Notary and Counsel as before.

[*Answer to Q. 256 continued by the witness.*]

The fifth criticism of the Liddell Patent by Mr. Stone, among those referred to in the question, is that the hook E′ on the edge of the forming-plate opposite its free and working-edge W, is not close enough to said plate E and does not extend far enough towards the working-edge W thereof to be effectual or operative. Having reference to operativeness in a practically commercial sense, which calls for uniform reliability and regularity of action, this criticism by Mr. Stone is well founded. The finger E′ should be both longer and closer to the plate, and it has been so constructed in complainant's exhibit "Operative Machine of Liddell Patent in Suit." Said actual machine is not open to this criticism of Mr. Stone, the finger referred to in said machine being thoroughly effectual and practically and commercially operative when of the longer dimensions and closer proximity shown for example, in complainant's exhibit "Drawing Liddell Forming-Plate Operating Parts."

The sixth criticism made by Mr. Stone of the Liddell Patent relates to the forming-fingers G G, belonging to the cylinder C, and the forming-fingers H H, belonging to the forming-plate E. He points out that the fingers GG are shown in the patent as "vibrating in a plane substantially parallel to a tangent to the circumference of the cylinder," and that "they are therefore never in close contact with the cylinder or the bag blank." He concludes that said fingers are "quite inefficient to keep said bag blank, in folding over, from slipping toward the inward end of said fingers, and thereby crushing the bag

blank." Similarly Mr. Stone points out, correctly, that the "fingers H H vibrate in a plane parallel to the face of the forming-plate," his conclusion being that they "are therefore inefficient to retain the bag blanks from slipping down their working edges." He tells how, by slightly inclining the axes of these several fingers, they could be made to bite or clamp the bag blank to the cylinder and forming-plate, respectively, but he adds that "even then the action of said fingers would probably push the bag blank more or less out of position, and thus produce an irregular and ill-formed bag blank."

Complainant's exhibit "Operative Machine of Liddell Patent in Suit" has the fingers G G and H H constructed and arranged in the relation to the cylinder and forming-plate, respectively, here pointed out by Mr. Stone as being shown in the Liddell Patent drawings and described in the Liddell specification. Nevertheless, Mr. Stone's criticism does not apply to that machine. The bags produced by the machine are not "irregular and ill-formed bags," but are on the other hand, exceptionally regular and well-formed. A large percentage of the culls or rejected bags produced in the regular running of the machine, and here in evidence, are, by comparison, greatly superior to many of the bags offered by defendant's counsel as the successful product of defendant's machine.

This sixth criticism of the Liddell Patent by Mr. Stone, necessarily based wholly upon theory, is therefore disproven by the actual machine constructed, with respect to the fingers referred to, in accordance with the Liddell Patent.

Mr. Stone follows his six strictures upon the Liddell Patent, above separately dealt with, with this statement:

> "After a very careful and detailed analysis of the draw-
> "ings and specifications of the Liddell Patent, No. 558,969;
> "in my judgment, a machine built in accordance therewith
> "*even with the exercise of good mechanical skill and judg-*
> "*ment, would be inefficient and impracticable for commer-*
> "*cial use.* It is obvious that the machine set forth in the
> "patent is only partially thought out and lacks important
> "details." (Italics are mine.)

As a matter of fact the parts shown and described in the Liddell Patent in suit are all present in the actual machine

referred to, and the changes made in said parts consist exclusively in giving the cams K and K′ their proper contours for actual working purposes; the proportions of the gears M′ and N suitable for the use of a convenient size of the cam K; the substitution of an extra cam wall around the cam K′ for the coiled contractile spring F′ to hold the yoke-arm to the contour of said cam; the application of the same additional cam wall for the same purpose to the cam K; and the elongation of the hook E′ on the forming-plate, and its closer proximation to said plate, than shown in the patent drawings. These changes are, in my judgment, only the natural result of reducing the machine of the patent to working shape, at the hands of a mechanic skilled in the art to which this patent relates. These changes meet the first, second, and fifth criticisms of Mr. Stone above considered. No changes have been made with respect to the third, fourth and sixth, except the merest formal change as to the manner of supporting the cam I, mentioned in the third criticism by Mr. Stone, he being entirely wrong in supposing any basis whatever to exist for said third, fourth and sixth objections. It seems to me, therefore, that, contrary to Mr. Stone's conclusion, the exercise of good mechanical skill in putting the invention shown and described in the Liddell Patent into working form, gives and has given a machine which is efficient and practical for commercial use. Also that the machine set forth in the Liddell Patent was very fully thought out, and lacks no important detail with respect to the diamond-forming mechanism shown and described therein.

[*Defendant's counsel objects to the last paragraph of the foregoing answer, which was inserted in the record immediately before the adjournment yesterday, on the ground that the statements contained therein have no relevancy to the question No. 256, to which the answer contained in that paragraph ought to have been confined; and defendant's counsel objects to everything contained in the foregoing answer, except such statements therein as set forth whether the six peculiarities specified by Mr. Stone as characterizing the Liddell Patent are respectively present or absent in the so-called Liddell machine, that being the entire scope of Q. 256*].

[*Recess.*]

After recess, 2 p. m.

Q. 257. Now please consider the prior art as set forth in the record of testimony and exhibits made on the part of the defendant herein, and which you have already stated you have read, considered and understand, and state fully to the court your opinion as to the effect of such prior art upon the Liddell Patent in suit, and the claims thereof, particularly claims 1, 2, and 7 in suit, and give reasons for any opinion you may express.

[*Defendant's counsel objects to the question on the following grounds:*]

[*First. The question was not put to the witness by complainant's counsel orally, but was brought by complainant's counsel in writing into the examination-room, and was copied by the type-writer into the deposition, under the direction of the Notary and against the earnest objection of defendant's counsel to any such proceeding.*]

[*Second. Defendant's counsel is informed and believes that the question, and the desired answer thereto, were "cooked-up" and concerted by the complainant's counsel and the witness Dayton in private consultation between them since the last question was answered; so that the question and the answer, when both are inserted in the record, will not represent any proper evidence of any facts, but will be more analagous to reading into the record the words of the expected answer from a phonograph cylinder which has been carefully impressed with those words in private consultation between the complainant's counsel and the witness Dayton.*

[*Third. The question, even if properly put, without previous consultation between complainant's counsel and the witness Dayton, is totally inadmissible, because it does not inquire into any fact whatever, but is confined to inquiring what opinion is held by the witness as to the effect of the prior art upon the Liddell Patent in suit, and the claims thereof, and particularly claims 1, 2 and 7, which inadmissibility results from the circumstance that the opinion of the witness upon that subject*

is entirely immaterial to all the issues of this case, and also results from the circumstance that that opinion, if it be an intelligent one, must be an opinion upon questions of law, which are well-known to be outside of the domain of the testimony of mechanical experts.

[*Fourth. The record of testimony and exhibits which the question asks the witness to consider and decide upon, and to render his opinion, consists of more than eight hundred large printed pages, and of more than twenty complicated drawings. It is totally inconsistent with the due administration of justice in a patent case for a mechanical expert to presume to consider and review in one answer to one question the great multiplicity of points of fact, and questions of law, which he must review and consider thoroughly if he is to express any intelligent opinion upon what effect that large record of testimony, and those numerous exhibits, should have upon the question of the validity, and the question of the construction, of claims 1, 2 and 7 of the patent in suit; because those are all questions of law upon which the opinion of the witness is totally inadmissible; and because those questions of law depend upon such a great multiplicity of evidence that it is wholly improper to ask the witness to state his opinion upon that vast subject in one answer, as if he were one of the spokesman of the oracles of Delphi.*]

[*The notary states, with reference to the method of procedure in the recording of the question No. 257, that the complainant's counsel first handed the question, in typewritten form to the notary, and requested him to read the same to the typewritist; that the Notary declined to comply with such request until he should have had a moment's opportunity to consider whether he had authority to put the question, as requested by complainant's counsel; that complainant's counsel, without waiting for such consideration by the notary, again took the printed or typewritten slip containing the question, and began to read the same to the typewritist; that the notary, in the midst of such reading, decided that it was immaterial whether such reading were done by the complainant's counsel or by the*

notary or some other person suitably deputized, or whether the question were copied into the record, and accordingly offered to and did instruct the typewritist to copy the remainder of the question into the record; the notary having been informed by complainant's counsel that he was obliged to leave the city in haste at this juncture, and had deputed Mr. Farnsworth, of his office, to represent him in his absence, during the remainder of the day, and possibly, as the notary understood, also upon the following day.]

A. Before answering the question I want to say that no word whatever has passed between complainant's counsel and myself as to what my answer, or any part of my answer, to this or any other question asked, or to be asked me, was or is to be, since I first went on the stand to give my rebuttal testimony in this case.

I understand the prior art to which the question has reference to be the twenty-three prior patents offered in evidence by defendant's counsel, and the testimony of defendant's witnesses, and particularly that of defendant's expert witnesses, relating thereto.

This prior art, in my judgment, affords a luminous background against which the invention of the Liddell Patent in suit is silhouetted in bold relief, the effect of such presentation of the Liddell invention to the investigator's eye being to disclose it clearly as one markedly and radically unlike any of its predecessors, and as one of conspicuous merit and value. It is just the sort of invention, in my judgment, which is best to be understood and appreciated by such a comparison as that now called for by the question. The prior art is precisely what is wanted to bring out its novelty and its merit.

TWO PRIOR SUCCESSFUL MACHINES.

The first fact to be noted in the record of the prior art is that the making of self-opening, square-bottomed bags from tucked paper tubular blanks is a relatively modern art. The second important fact to be noted, as shown by defendant's testimony, is, that at the date of filing the application for the

Liddell patent in suit, there were practically but two kinds of bag-making machines in successfully established commercial use, for making such self-opening square-bottomed bags from tucked or bellows-folded tubing, namely, the Stillwell machine, of the two patents to Stillwell No. 407,794, dated July 30, 1889, and No. 417,346, dated December 17, 1889, and the Lorenz & Honiss machine of the two patents to Lorenz & Honiss, No. 331,722, dated December 1, 1885, and No. 361,951, dated April 26, 1887. Other machines had been tried and used to a small extent, but they have failed of survival, as I understand the fact, and to-day I believe there are no machines, devised prior to the date of the Liddell invention, having commercial existence, other than the Stilwell and Lorenz & Honiss machines above mentioned.

The performances of the Liddell invention embodied in Complainant's Exhibit "Operative Machine of Liddell Patent in Suit" show that it stands abreast of these two solitary successes of the prior art, even though said Liddell machine be the first made under the patent, and though made under narrowed restrictions to the details shown and described in the patent for the purposes of evidence in this suit, and not for the purpose of attaining the highest results of which that invention is undoubtedly capable, when elaborated and refined by mechanical change, or by the addition of subordinate and contributory inventions.

Compared with these successful machines of the prior art, the Liddell invention will be readily seen to have little in common with either, and to be radically and fundamentally different from both in its distinguishing and essential features and principles. The Lorenz & Honiss machine (whose diamond-forming mechanism was shown first in the Lorenz & Honiss Patent No. 361,951, of April 26, 1887), employs a horizontal reciprocatory bed in combination with a correspondingly reciprocatory presser-plate, having in addition to its reciprocating horizontal movement, a short vertical parallel or up-and-down movement, and tuck-entering side-folders formed of hinged parts adapted to unfold and turn the upper ply of the bag blank backwardly over the edge of the presser-plate in the ad-

vancing movement of said plate with the bed. The opened end of the bag blank is thus opened out into the form of an open-topped box. The forward end of this box is then centrally pressed forward from the inside at an increased speed, thus forming the front flap of the diamond. This front flap is seized at its central point by suitable devices, and the blank is drawn forward while at the same time the paper is drawn beneath a descending plate which presses down the rear point of the diamond upon the blank passing beneath it.

The Stillwell machine, which employs no bed at all upon which to form the diamond, has its diamond-forming mechanism illustrated on sheet 13 of the earlier Stillwell Patent, No. 407,794, and on Sheet 8 of the later Patent, No. 417,346. By reference to these drawings of the two Stillwell patents it will be seen that the blank passes between a pair of feeding-rollers, G G′ (of the later patent), the lower one of which rollers is made of suitable size to make one revolution for each bag blank, said lower roller G being varied in diameter for the different lengths of bags to be made. Opposite the roller G at the side at which the bag blank emerges from the rollers G G′ is placed a narrow, central roll J, loosely journaled in spring-supported bearings beneath a positively rotated, superposed roll I, whose lower surface is moving in the same direction as the bag blank. A vertical bar O′ of the same narrow width as the edge of the roll J, is arranged tangential to said roll J and directed downwardly from the side of the latter adjacent to the roll G. The roll G is provided at one point in its circumference with a clip or gripping finger g^7, which, as the end of the blank just passes out from between the rolls G and G′, grips the lower ply at its central end portion to the roll G so as to carry said lower ply downward, as shown on Sheet 8 of the patent, 417,346. The upper ply passes forward and is caught between the rolls I and J so as to be drawn forward nearly to a horizontal direction. After the gripping-finger shall have carried the end of the lower ply down past the upper end of the vertical narrow bar O′, it is retracted and releases the paper, which is thereafter guided downward by said bar O′. When the blank shall have passed out from between the feeding-rolls G and G′ a proper

distance, a vertically guided tucker-plate P is made to descend with its lower edge in bearing against and across the upper ply of the blank, and to force the paper downward beneath it, as better shown on Sheet 13 of the earlier Stillwell patent 407,794. But meantime, as proper points in the length of blank reach and pass the top of the lower feeding-roll G, side fingers, mounted to move with said roller, enter the side tucks of the blank and grip the lower ply at its edges to said feed-roller G for the purpose of defining the lines of the triangular folds in said lower tuck. These side-clips retain their hold upon the bag blank after the central end-clip g' has released the blank, and contribute to the proper advance of the blank downwardly to the subjacent carrying-rolls M M'. The upper corners of the triangles of the bag blank are determined in the machine of the earlier patent by a pair of inside fingers entering the opened mouth at opposite sides of the expanding roller J of the later patent, or L' of the earlier patent. The later patent shows cooperating external fingers M shown on Sheet 7, where the inner fingers are shown at L L.

It is evident that the Stillwell machine, only generally described above, is widely distinguished from the Lorenz & Honiss machine. It will now be seen by comparison of the machine of the Liddell Patent in suit with both these survivors of the art prior to Liddell, that said Liddell machine is as distinctly different from either the Lorenz & Honiss, or the Stillwell machine, as said Lorenz & Honiss and Stillwell machines are different from each other.

[*Adjourned to Saturday, November 14, 1903, at 10.30 A. M.*]

Saturday, November 14, 1903.

[*Met pursuant to adjournment.*]

Present—The Notary and Counsel as before.

[*Mr. Dayton continues his answer to Q. 257.*]

Machine of Patent in Suit.

The machine of the Liddell Patent is characterized by the use of a bed or series of beds on which the diamond-fold is to be formed, which bed or beds has or have a continuous advancing movement, as distinguished from the reciprocating movement characteristic of the single bed of the Lorenz & Honiss machine referred to. A continuously advancing bed or series of beds necessarily involves a rotary motion by which the bed, or series of beds, is returned to working position otherwise than through its path of advance. The simplest form in which a continuously advancing bed or series of beds may be embodied is manifestly the form of a cylinder, and this is the particular form of the bed structure shown in the Liddell Patent in suit.

Another characteristic feature of the Liddell invention and machine is the co-operative combination with a continuously advancing or rotating series of beds, of a vibratory forming-plate occupying a stable position with respect to the traveling beds, whereby it may act upon or over them in succession, upon succeeding bellows-folded, tubular paper blanks. This forming-plate, to occupy such stable position relative to the traveling beds, must not be mounted on the bed structure, but must be mounted and supported independently of and externally to the bed.

In the Liddell conception of the combination of a local, vibratory forming-plate with a continuously traveling bed structure, as disclosed in the patent in suit, it is contemplated that the vibratory forming-plate shall be given a starting position in a plane substantially parallel with a tangent to the cylinder, and sufficiently distant from the cylinder, to permit the introduction of the bag blank beneath the plate and between it and the cylinder. From this starting position the plate is to move at

its creasing edge towards the cylinder, and into contact at said edge with the blank. From this point the forming-plate is to rock, or vibrate, on its creasing edge as an axis, said edge of the plate advancing in contact with the bag blank and at substantially the same speed therewith. Both the plate and the cylinder are provided with side fingers which are to enter the tucks in the sides of the bellows-folded tube at points opposite each other, and where the diverging fold lines of the interior side triangles, peculiar to the diamond formed upon a bellows-folded blank, are to be made. As the cylinder, bag blank and creasing edge of the forming-plate simultaneously advance, and as the forming-plate rocks away from the cylinder about its axis at its creasing edge, the side angle-forming fingers hold the upper and lower plys of the blank to the forming-plate and cylinder respectively, the upper ply of the blank following the movements of the forming-plate, and the lower ply the movement of the cylinder. These side fingers, however, act upon the respective plies of the blank only between the edge of the forming-plate and the ends of the blank plies. The end of the lower ply is centrally confined to the cylinder in either of several ways, two of which ways are set forth in the patent. Similarly the end of the upper ply will be centrally held to the forming-plate by any suitable device, the particular device for this purpose shown in the patent being a finger E′, movable with the forming-plate, and which, in the initial or receiving position of said forming-plate, enters the end of the bag blank. The rocking movement of the forming-plate is continued until the plate reaches a position proximating a tangent to the cylinder, reversed from that at which it commences to act upon the blank, or, in other words, the plate rocks on its edge between 90 and 180 degrees. In such rocking movement the main transverse fold of the diamond is made entirely across the upper ply of the bag blank, the converging fold lines of the side triangles are defined, and the paper is laid inward at its sides to give the converging side boundary lines of the end flaps, or points of the diamond, all as fully set forth in the Liddell patent, and as particularly illustrated in Complainant's Exhibit "Drawing Liddell Machine Parts Opening Diamond."

But in the execution of this conception of mode of operation on the part of the combined rotary bed and oscillatory forming-plate is involved a feature which I have not, so far, mentioned at all. This feature is the provision of a second axis of vibration, or movement, of the forming-plate, additional to its working axis at the creasing edge of said plate. This second and additional axis of the forming-plate is the supporting axis of said plate by which the latter is held in its local position while the bed structure travels past it continually in one direction. Said second and supporting axis is remote from the working axis or edge of the plate and, as the plate is held by said second axis in its local position, the rocking of the plate on its working edge in the formation of the diamond, involves the movement of the working axis past the supporting axis, or from one side to the other of a line or plane passing through the supporting axis of the plate and the axis of the cylinder. Inasmuch as the working edge of the plate bears against the blank resting on the cylinder, and follows said blank in contact therewith during the diamond-folding operation, this movement of the working edge past the supporting axis of the plates involves the necessary provision for a relative movement towards and from each other of said supporting axis of the plate and the surface of the cylinder. This is a vital part of the Liddell conception and, in the particular embodiment of the invention shown in the patent in suit, he gives the actual movement to the supporting axis of the plate.

We have thus in the Liddell invention, as disclosed in the patent in suit and in the faithful embodiment thereof "Complainant's Exhibit Operative Machine of the Liddell Patent in Suit," a machine which is radically different from either the Stilwell type of machine or the Lorenz & Honiss machine, above referred to. It is different in principle, in construction, and mode of operation. Said Liddell invention, therefore, contributes to the art of making self-opening square-bottomed paper bags from bellows-folded tubing, something wholly new and, as shown by the actual machine, something of great value.

Lorenz & Honiss Patent, 333,647.

The novelty of the Liddell invention in its use of a rotary or continuously advancing bed is, in my judgment, rather emphasized than otherwise by pointing out that in a single instance of the prior art, shown by defendant's twenty-three earlier patents, a rotary bed, or cylinder, was shown in a machine for manufacturing such bags from such tubing prior to the patent in suit. I refer to the machine shown and described in the Lorenz & Honiss patent No. 333,647, concerning which the testimony shows that only one hand-machine containing the diamond-forming devices of said patent was built and tried upon bag blanks. It appears that no other and commercial machine was ever built in accordance with this patent (see testimony of W. A. Lorenz, pp. 143 and 144, D. R.).

The rotary-bed machine of this Lorenz & Honiss patent No. 333,647, preliminarily opens the end of a blank out into the form of a box, as shown in Fig. 20 of the patent drawings. The bottom of the box formed by the machine contains, along the transverse middle of the box, the main transverse fold in the upper ply, and the triangular folds in the side tucks. To make these folds the cylinder is made to carry opposite sets of triangular folding-blades, 31, 33, and 34 of Figs. 18 and 20. At stated times these blades, while folded upon each other, as shown in Figs. 13 and 14 (with the intermediate blade 33 close to the bottom blade 31 and with the top blade 34 slightly elevated above blade 33, as shown in Fig. 13), are thrust inward so that the middle and bottom blades 33 and 31 of each set enter the side tuck of the blank, and blade 34 passes over the top of the blank. By a rotary movement of the middle and upper blades on the axis of the transverse edge of the blade 33, blades 33 and 34 are made to clamp the upper ply and to turn over said upper ply away from the lower ply, and into a position substantially tangential to the cylinder, or about in line with the originally lowermost blades 31, which remain in substantially their original position, not sharing the overturning movement of the clamping blades 33 and 34. This, as stated, opens the end of the blank into the box form, shown in Fig. 20, which is subsequently reduced to the diamond-form ultimately desired, by a separate and distinct operation, and by separate and distinct devices.

[*Recess.*]

[2 p. m.]

There is obviously nothing in this construction at all corresponding with or suggestive of an externally and independently supported oscillating forming-plate provided with tuck fingers, or other means for raising the upper ply of a tucked tube inserted beneath it, which is a characteristic feature of the Liddell Patent and invention. The folding-blades of the Lorenz & Honiss machine just referred to are all carried around with the cylinder, being mounted on slides running in guides in the cylinder structure, and partaking of the continuously rotating movement of said cylinder. The whole operative scheme of the one machine is radically different from that of the other. Wherefore, in my judgment, said Lorenz & Honiss patent, No. 333,647, has no more bearing upon the Liddell Patent in suit than have the previously mentioned Lorenz & Honiss patents and machine, or the previously mentioned Stillwell patents and machine, which clearly have no bearing whatever on the Liddell patent and invention.

Defendant's Exhibit Drawings.

Indeed, as I read defendant's record, no pretence is made by defendant that any patent or machine antedating the Liddell invention, anticipates the latter. The testimony of defendant's expert, Mr. Stone, on this subject is directed exclusively to supposititious drawings submitted to him, representing assemblages and conjunctive arrangements of parts taken from different patents by different inventors, and put into new relations of which none of the inventors are shown to have ever thought or contemplated, and yet in no case pretending, even then, to represent an operative machine for the purposes of the Liddell Patent. These drawings are manifestly composed in the light of the Liddell Patent for this occasion, and in so far as they may possibly show anything related to the Liddell invention, they show to what the Liddell Patent may lead rather than from what the Liddell invention is derived.

Defendant's Drawing No. 6.

Defendant's Drawing No. 6 shows in column 1 the Stilwell type of machine with certain additions or improvements devised by Lorenz & Claussen, and set forth in the Lorenz & Claussen patent No. 534,512, dated February 19, 1895. Everything in the four figures of said first column of this defendant's drawing No. 6 is distinctively of the Stilwell invention, with the sole exception of the vibratory fingers 71, which are fingers for clipping the tucks of the upper ply of the blank to the vertically reciprocating tucker-plate 50 of the Stilwell mechanism. 71 in these four figures of Column 1 Exhibit Drawing, is only one of a pair of such fingers, both of which are shown at 71 and 72, Sheet 4, of the drawing of the Lorenz & Claussen Patent No. 534,512.

It is not urged that the construction of Column 1 of defendant's Drawing No. 6, representing what was actually shown in a patent prior to the patent to Liddell in suit, has, of itself, any anticipatory or even restrictive bearing upon said Liddell Patent, but, in the four corresponding figures of Column 2 of said defendant's drawing No. 6 is shown what is called at the head of the column "Modified L and C [Lorenz & Claussen] 534,512." Of these figures so designated it should be stated that the Lorenz & Claussen Patent referred to shows no such alleged modification, and that said so-called modification is not found anywhere in the prior art. It is purely and clearly a recent production made apparently for the purposes of this case, and is disowned by defendant's expert, Mr. Stone, who testifies concerning it, as not being of his devising, but as being shown in the drawing as the latter was given and explained to him by defendant's counsel (see Stone x-Q. 182 and 183, page 306, D. R.). It is this manufactured and (as will appear) absurd and ridiculous so-called modification of the mixed Stilwell and Lorenz & Claussen mechanism of Column 1 of the drawing that is asserted by defendant's expert to bear significantly upon the Liddell Patent in suit.

I will now point out what this alleged "Modified L & C, 534,512" consists of. First, there are present therein the same Stilwell feed-rollers 11 and 12, the lower one of which is a de-

flector for the lower ply of the bag blank, for which purpose it is provided, as in the Stilwell Patent, with the central clip or finger 29. It has also a pair of appropriately placed side-clips or fingers 19 for clamping the margins of the lower ply to the deflecting feed-roll 11 at the points where the triangle folds are to be made in the lower tuck. It also has the stationary central bar or finger 40 behind which the end of the lower ply is delivered by the centre clip 29. And further, it retains the vertically reciprocating tucker-plate 50 of the Stilwell patents and machine. There are omitted from the figures of this middle column of the drawing the Stilwell distending rolls 37 and 42, and also the Lorenz & Claussen folding and clamping fingers 71 and 72. There are added, in place of these omitted parts, a second tucker or forming-plate 67, taken from the Lorenz & Honiss patent 337,966, and shown in that patent to have side-clips or fingers at 82, and a similar clamping end-clip or finger, for clamping the central point of the end of the upper ply to said plate 67. This end-clip of the Lorenz & Honiss patent is, however, omitted, and in its place is substituted a fixed finger K^3 taken from a patent fo Cross, No. 224,464, wherein said finger is marked k^3 and is shown in connection with a machine for opening out the diamond on an *untucked* tube in making what are known as "satchel-bottomed bags." The tucker-plate or folding-plate 67 of the Lorenz & Honiss patent No. 337,966 is, in said so-called "Modified L & C 534,512" of defendant's drawing No. 6, supposed to be somehow pivotally connected with the Stilwell tucker-plate 50 on the line of their coincident edges, and, said plate 67 of the said Lorenz & Honiss patent being a creasing, folding or tucker-plate, we have shown in this "Modified L & C" construction two tucker-plates, creasing-plates or folding-plates where only one is necessary or can be utilized for creasing purposes. This is a feature which I consider absurd to the point of ridiculousness.

Moreover, in said Lorenz & Honiss Patent No. 337,966 the creasing and folding-plate 67 is combined with a reciprocating-bed of a self-opening square bottomed bag machine, and is mounted directly on the reciprocating carriage carrying the bed and shares the backward and forward motions of said

carriage, while it also rocks on its creasing edge as an axis over the bed and bag blank thereon. The pivot on which said creasing and folding-plate 67 of this Lorenz & Honiss patent rocks in the machine of that patent is coincident with its creasing edge, so that said plate has only one axis of motion. This is practicable in a reciprocating-bed machine, because the bed comes back every time to its starting point, as the forming-plate is also required to do. This is a wholly different case from that of a continuously traveling bed or series of beds, as, for example, those on the cylinder of the Liddell Patent in suit, where the beds continuously pass onward in the same direction and only the forming-plate is required to come back to its starting place.

In the "Modified L & C 534,512" of Defendant's Drawing No. 6, this single axised folding-plate of the Lorenz & Honiss Patent, No. 337,966, has been taken away from the reciprocating carriage where it belongs and where it has its appropriate double function of a creasing-plate and a top ply lifter, and has been attached to another creasing or tucker-plate 59, of the Stilwell machine, where it is not wanted for creasing purposes, and where it discharges only the function, therefore, of a top ply lifter, in place of the devices shown for that purpose in the figures of Column 1 of said Defendant's Drawing.

[*Adjourned to November 16, 1903, at 10.30 A. M.*]

[*Monday, November 16, 1903.*]

[*Met pursuant to adjournment.*]

Present—The Notary and Counsel as before.

[*Mr. Dayton resumes his answer to Q. 257.*]

The fanciful construction indicated in Column 2 of Defendant's Drawing No. 6 under the heading "Modified L & C. 534,512" is not what, in my judgment, may be called a *modification* of the mechanism shown in the first column of this drawing, any more than it is the construction of the Lorenz & Honiss patent 337,966, or that of the Liddell Patent in suit. And,

in my opinion, said fanciful construction is inoperative on its face for the reason which I shall now briefly state.

In the Figures of Column 1 of this drawing there are means for opening the end of the blank by action upon both its upper and lower plies. The lower ply is deflected downwardly over the lower feed-roller 11 by the end-clip 29 and the side-clips 19. The upper ply is deflected upwardly and held up by the roller 37, which rotates clockwise, (as viewed in the drawing), and, moreover, said upper ply is drawn outwardly in its elevated position by the co-action of the two rollers 37 and 42, so as to have somewhat the attitude indicated in Fig. 2 of said first column of the drawing. In this position of the upper ply, forced by the action of the rollers 37 and 42 in opposition to the devices carrying the lower ply downward, the opposite tuck-fingers 71 and 72 of the Lorenz & Claussen patent 534,512 are given an opportunity to definitely enter the partially opened side-tucks preparatory to the movement of the adjacent portion of the upper ply towards and against the tucker-plate 50. But in the fanciful construction of the second column in this drawing there is nothing indicated for controlling the position of the upper ply of the blank end for its engagement by the finger and clips on the vibratory plate 67. In Fig. 2 of the second column the vibratory plate 67 is shown engaged with the upper ply of the blank, it is true, but that is merely in the picture, and anything can be done in a picture. There is absolutely nothing in the mechanism to put the blank into this position for such engagement by the plate. For this reason alone, if there were no other reasons, I regard the illustrations given in column 2 of this Defendant's Drawing No. 6 as obviously not in any sense a "modification" of the construction shown in column 1, and as having no warrant whatever in column 1 or in the Lorenz & Honiss patent, 337,966, from which the plate 67 and its attachments are borrowed. I regard said device of column 2 as an independent invention, though, inoperative and worthless.

Furthermore, said device of column 2 of Defendant's Drawing No. 6, although originated apparently in the progress of this suit, and for the purpose of showing a similarity to the con-

struction of the Liddell Patent, fails to show any real correspondence therewith. The plate 50 of said second column of figures is still the tucker-plate of the Stilwell machine, as is the plate 50 in Column 1. That plate has no oscillatory movement on its creasing edge as an axis, but has solely a vertical, up-and-down movement. Moreover, it does not co-operate with a bed, rotary or reciprocating, as does the oscillatory creasing-plate E of the Liddell Patent and machine. There is, in fact, *no bed whatever* in the Stilwell machine or in its improved construction shown in the Lorenz & Claussen Patent 334,512, and illustrated in column 1 of this drawing. The diamond in this machine is formed largely in the air. The tucker-plate has its path arranged tangential to the deflecting-roller 11 and the creasing edge of said tucker-plate 50 does part of its creasing and folding work above, and the other part below, the touching or proximating point of said edge with the deflecting roller. This is shown conclusively by Fig. 2 and Fig. 4 in column 1 of this Defendant's Drawing, which show respectively the beginning and the ending of the action of the creasing edge of the tucker-plate 50 on the blank. The case is not altered in the miscalled "Modified L. & C., 534,512," of column 2. The edge of the plate 67 added to the tucker-plate 50 in column 2, being arranged to coincide with the edge of the tucker-plate 50, has necessarily the same path as said edge of plate 50, and the same relation to the surface of the deflecting-roll 11. And said edge of the plate 67, being reciprocated in a straight line in the supposed construction of column 2 of this Defendant's drawing, has the same rectilinear path that it had in the Lorenz & Honiss patent, 337,966, from which it was taken. It, therefore, has no correspondence whatever with the creasing and forming-plate E of the Liddell patent, the creasing edge of which, throughout its creasing and folding operation preserves contact with or proximity to the revolving bed.

Of course there is nothing in the so-called "Modified L & C. 534,512" of Defendant's Drawing No. 6 answering to the second and supporting axis of the vibratory creasing and forming-plate which characterizes the Liddell invention and machine.

and on which said plate rotates while its free and creasing edge is doing its work on the blank. And it follows that there is no mechanism in said second column of this drawing connected with a second and supporting axis of the plate for its rotation, and no mechanism anywhere present in the device of said second column for keeping a free creasing edge of the plate in permanent contact or proximity with a rotary bed during the formation of the diamond, as there is in the Liddell Patent and machine. Wherefore, in my judgment, the fanciful construction shown in the middle column of Defendant's Drawing No. 6 under the heading "Modified L & C, 334,512," has no bearing whatever on the invention set forth in the Liddell Patent in suit, either anticipatory or restrictive.

[*Now, at twelve o'clock M. Monday, November 16, 1903, counsel on both sides agree to adjourn the taking of this deposition to be resumed at 451 Washington Street at one o'clock p. m.: with the understanding that the testimony taken at that time and place is to relate to other matters than the Q. 257, and that that testimony may be taken down in shorthand by the notary, and afterward written out in typewriting, in the form of questions and answers, to be numbered Q. 258, etc., and to be inserted in the record after the completion of the answer to Q. 257, which answer is to be continued at the office of complainant's counsel until it is completed, and after the testimony is taken at 451 Washington Street.*]

[*Adjourned to 451 Washington Street at 1 p. m.*]

[*Tuesday, November 17, 1903.*]

[*Met pursuant to adjournment at 120 Broadway.*]

Present—The Notary, Counsel as before, and the witness, Mr. DAYTON, who continues his answer to Q. 257.

[*Answer to Q. 257 resumed.*]

What defendant's expert, Mr. Stone, says about this so-called modified Lorenz & Claussen machine "shown in the figures of the middle column of said Defendant's Drawing No. 6" is especially remarkable as not being true, in one very important particular. On page 205, D. F. R., Mr. Stone says that the supposititious machine of these figures of the drawing "*would*

show a machine conforming in every respect to the language of Claim 1, Claim 2, and Claim 7 of the Liddell Patent." He then quotes several claims, including these words found in each:

> "operating means for the forming-plate adapted to cause "the said plate to oscillate about its rear edge *upon the "surface of the cylinder*, during the rotary movement of "said cylinder."

Of course it is wholly unimportant what any machine devised since the Liddell Patent "*would* show," but, as a matter of fact, this particular contrivance of column 2 of this drawing does *not* show any plate oscillating "about its rear edge upon the surface of the cylinder," or any means for causing any plate to so oscillate "upon the surface of the cylinder." The bottom edge of the plate 50 and the rear edge of the plate 67 both pursue a vertical course in their action upon the paper blank, tangential to the surface of the lower feed-roll 11 (which Mr. Stone calls the "cylinder"), and proximating the surface of that feed-roll or cylinder only in the middle portion of their folding action upon the blank.

I do not undertake to explain how Mr. Stone could have quoted these words of the claims three times in immediate connection with his allegation that these, as well as the other terms of the claims, "would be" complied with "in every respect" by the contrivance of the middle column of said drawing.

Another part of Mr. Stone's comment on this supposititious construction, shown in the middle column of Defendant's Drawing No. 6, is notable as showing the extreme liberality of that gentleman in dealing with incomplete structures of his own or Mr. Walker's suggestion, in contrast with his rigorous exactions of the Liddell Patent. He concludes his answer as to said drawing with these words:

> "Furthermore, it would be within the reach of mechani- "cal engineering skill in paper bag machinery, to thus "modify the Lorenz & Claussen machine of Patent 534,512 "from the Lorenz & Honiss machine of Patent 337,966, "any time after the issue of that patent on February 19th,

"1895, to Lorenz & Claussen. Furthermore, it would not "involve invention to substitute the front finger K^3 [it "should be k^3] from the Cross Patent No. 222,464 for the "movable front finger of the Lorenz & Honiss Patent No. "337,966, as is done in the modified Lorenz & Claussen ma- "chine, No. 534, 512, shown in the middle column of De- "fendant's Drawing No. 6."

It seems to me to follow that the constructor of the Liddell machine may, without criticism, lengthen the finger E′ on the forming-plate E and may make it closer to the forming-plate, to correspond with the finger k^3 of said Cross Patent, or may, if he chooses, put the positive end-clip of the Lorenz & Honiss patent, No. 337,966, in place of said finger E′, or, finally, that he may, if he chooses, employ clamping-fingers at the sides of said forming-plate, as well as a clamping-finger at its end, as shown on the plate 67 of said Lorenz & Honiss patent, in place of the side and end fingers actually shown in the Liddell patent. This has been my contention in my *prima facie* depositions, and I am gratified to find it justified, first, by the presentation of the Lorenz & Honiss forming-plate 67, in the figures of column 2 of Defendant's Drawing No. 6, as having a bearing on the Liddell invention, and, second, by this positive, above quoted, statement of defendant's expert. But such statement by defendant's expert and such figures of Defendant's Drawing No. 6 do not in any wise supply the essential deficiencies of said figures of the drawing. Neither the Lorenz & Claussen patent, 534,512, nor the Lorenz & Honiss patent, 337,966, discloses means to make the supposititious "Modified L & C, 534,- 512" operative, and the latter stands, in my judgment, as a merely fanciful, incomplete, and inoperative, and recent graphic production of no significance whatever in relation to the Liddell invention, partly shown in the figures of column 3 of said Defendant's Drawing No. 6.

Defendant's Drawing No. 5.

Before the discussion in defendant's record of Defendant's Drawing No. 6, the Lorenz & Honiss patent No. 337,966 was separately considered in connection with Defendant's Drawing No. 5, produced by Mr. Stone in answer to Q. 22, page 199, D. P. R. The object of Defendant's Drawing No. 5 and of the testimony concerning it, given in answer to Q. 22, appears to have been solely to show that the upper ply of a paper bag blank is acted upon by the forming-plate and by the end and side fingers thereon in essentially the same way in said Lorenz & Honiss machine of patent 337,966 as in the machine of the Liddell Patent, the conclusion of Mr. Stone after such comparison, being expressed as follows (top of page 201, D. P. R.):

> "It thus appears that the several manipulations of the "bag tube, in the formation of the diamond, as set forth in "figures 5, 6, 7 and 8 of the Liddell Patent, are identical "with the several manipulations of the bag tube in the "formation of the diamond, in the Lorenz & Honiss patent, "No. 337,966."

Outside the detached forming-plate of said Lorenz & Honiss patent, 337,966, and the fingers or clips carried thereby, there is no pretence made in any part of defendant's record that said machine has any structural correspondence whatever with the machine of the Liddell Patent in suit, and the ultimate object of bringing in said Lorenz & Honiss patent seems to have been exclusively to prepare for the aborted mongrel construction of column 2 of Defendant's Drawing No. 6. I therefore, need only say in connection with the Lorenz & Honiss patent No. 337,966, and Defendant's Drawing No. 5, showing only the forming-plate thereof, with its end and side fingers, that the machine of said patent is one having a reciprocating carriage for both the bed and the forming-plate; that the forming-plate is pivoted on the carriage by trunnions placed in axial line with the creasing edge of said forming-plate; that the bed for the blank has a rising and falling movement, being lowered away from the creasing edge of the forming-plate to admit the blank beneath the latter, and thereafter raised preliminary to the creasing and

folding action of the forming-plate, and that the bed and the forming-plate both travel back and forth together with the carriage on which both are mounted, the advancing and folding movement accompanying the advance of the blank, and the retractive movement of the carriage with its connected bed and plate being made in opposition to the movement of the next blank to be operated upon.

If I am to infer from the silence of Defendant's Record concerning this Lorenz & Honiss patent, 337,966 (except as above noted), that it is not regarded by defendant as having any bearing upon the Liddell patent in suit, outside the single element of a forming-plate equipped with end and side fingers, I am in agreement with defendant. There is absolutely nothing in said Lorenz & Honiss patent suggestive of the possibility of combining said forming-plate in any manner whatever with a rotary bed. The forming-plate therein has only a single axis, which is both its creasing and supporting axis, and the problem of combining it with a rotary bed or cylinder was wholly left to the solution of Mr. Liddell, who, in solving that problem by the provision of a second axis on the forming-plate, remote from its working axis, for the independent support of the forming-plate in a definite place relative to the path of the continually advancing or rotary bed or series of beds, and by the provision of actuating mechanism for said forming-plate operating through its supporting axis, made, in my judgment, a wholly radical and revolutionary invention, towards which there was nothing whatever to lead him in said Lorenz & Honiss patent, No. 337,966.

Following the presentation of Defendant's Drawing No. 6, which presented the hybrid entitled "Modified L & C. 534,512," Defendant's Drawing No. 7 was produced and considered by Mr. Stone.

Defendant's Drawing No. 7.

In the first column of this, Defendant's Drawing No. 7, are illustrated several positions of the diamond-opening devices of the Crist patent, No. 543,571, which shows and describes a machine for folding the diamond on *untucked* paper bag blanks

in the manufacture of so-called "satchel-bottomed" bags. Concerning the formation of the diamond on untucked tubes it is proper to say, to begin with, that the problem is a very simple one, and wholly different from that of forming the diamond on tucked or bellows-folded tubes. As I understand the fact, the trouble has been, not so much to make a machine for operating upon untucked tubes, as to make a machine which will open the diamond on such tubes as rapidly as the work can be done by the fingers of girls. All that is necessary is to make a transverse crease in the blank and to hold the central point of the end of the lower ply down while centrally seizing and lifting the upper ply up and turning it over so as to fold it back upon the body of the blank on the line of the crease, or to hold the blank under a presser-plate having its edge on the line of the proposed fold, and to turn over the upper ply on said edge. This can be done by hand with such rapidity that, as I before stated, the difficulty has been to get a machine that will do the work as rapidly, or with sufficient additional rapidity, to warrant the expense and trouble of having a machine at all.

The machine of the Crist patent, No. 543,571, is a machine proposed for this simple operation. Figs. 11, 12 and 13 show the bag blank, first (in Fig. 11), cut and slitted, next (in Fig. 12), with the diamond folded thereon, and, finally (in Fig. 13), with the flaps of the diamond folded one upon the other to complete the satchel bottom of the bag. Turning to Figs. 21 and 22, a rotating cylinder is shown at M and the folding, plate-formed fingers which enter the end of the bag blank (one entering one bag blank and the other the next one), and turn over the upper ply, are shown at T T in Fig. 21. Said plate-formed fingers are attached to the middle of a transverse shaft S journaled in the ends of arms R R, which at their opposite ends are secured to a rock-shaft, not lettered. The shaft S carries a square block d^2, near one of the arms R, upon the upper edge of which block presses a plate spring c^2 attached to the adjacent arm R. Near the opposite arm R the shaft S has affixed thereto a pair of oppositely directed arms s, provided each with a crotched extremity t, and a second pair of oppositely directed arms h^2, arranged at right angles to the arms s. From the

adjacent side of the cylinder M project fingers m^2 and t^2, respectively in position to engage the ends of the arms s and h^2.

A series of slitted and partially separated tubular blanks, with untucked sides, pass up one side of the cylinder M, over its top, and down the other side, under such tension as hold the connected blanks firmly to the surface of the cylinder. The tube is not only slitted and severed (except as to the central connection between them at the under ply), but is also transversely creased at the points where the main transverse fold of the diamond is to be made, to wit: at 5 ...6, Figs 11 and 12.

[*Recess (at 1 p. m.) until 2 p. m.*]

As the string of connected paper bag blanks passes over the top of the cylinder M, having been cut and creased on their approach to the top of the cylinder, the plate-formed fingers T revolubly pass through the several positions shown in Figs. 7, 8, 9 and 10 of Sheet 7 of the Crist Patent Drawings. The position of the fingers shown in Fig. 7 is that shown of them in Figs. 21 and 22. In this position one of the fingers T enters the end of one of the connected blanks beneath the upper ply thereof, said upper ply rising slightly away from the lower ply by reason of the transverse crease made in it by the creasing blade on the roller P, and because the upper ply is not under the tension which holds the lower ply down to the cylinder. *The fingers T are never wider than the tongues left between the longitudinal slits 3 ... 4*, shown in Figs. 11 and 12, and, consequently, said fingers may practically ride on the very surface of the blank which, between these slits 3..4, closely hugs the cylinder. When the cylinder has turned far enough to bring the crease in the blank over the free edge of the finger T, the pin m^2 on the end of the cylinder strikes into the crotch t of one of the arms s and revolves the arm and the finger through the position shown in Figs. 8 and 9 to the position shown in Fig. 10, the finger T which has done the folding of the upper ply from the inside now lying on the top of the overturned upper ply. While the fingers are in this position of Fig. 10 one of the

arms h^2, having been revolved into position in the path of the next pin t^2, is struck by said pin and causes the shaft S to be further rotated a short distance. Meantime the spring c^2 has been raised by the corner of the square block d^2, and said corner of the block having been moved past the vertical by the action of the pin t^2 on the arm h^2, the spring further rotates the shaft S and brings the next finger T down into the position shown in Fig. 7, ready to enter the end of the next blank.

Several important facts are to be observed as characteristic of this satchel bottom machine. First, *two* opposite fingers T T are necessary. The combined action of the whole series of devices for revolving the fingers operate to give the shaft S only a half revolution. Secondly, the mounting of the fingers on the pivoted arms R R, the projection of the fingers in opposite directions, and the starting of the revolution of the fingers by the striking of pins on the cylinder against the arms *s s*, are like those operations in the double raking device of the old-fashioned and well-known horse hay rake, wherein, when the teeth at work reach the place for the windrow, the points of the teeth are made to engage the ground, so as to tip over the rake and bring the opposite set of teeth into working position. Thirdly, the finger plates T T are, as the patent says, "of just sufficient breadth to enter the paper blank *between* the slits cut by the knives *i i*" (the longitudinal slits 3 ... 4), and said plates actually thrust themselves into the inside of the end of the blank, and act exclusivsly from the inside of the blank in the entire operation. Fourthly, the creasing of the blank along the transverse line upon which the rear flap of the diamond is to be opened out, is performed before the blank reaches the spreading-fingers, and said spreading-fingers T T, and anything else connected with the shaft F, have nothing whatever to do with the creasing of the blank for the main diamond fold.

No testimony that I recall has been given, going to show that the machine of the Crist patent for forming diamonds on untucked tubes is a practically operative machine, or that it has ever been put to use, and I doubt its practical operativeness at any such speed as would make it commercially advantageous.

The reason for this opinion is that run at a high speed, there will necessarily be a severe shock in starting the revolution of the fingers by the striking of the pin m^2 against the crotched ends of the arm s. Said pins m^2 are necessarily moving at the same speed as the cylinder to which they are attached, and they necessarily give a sudden motion to the parts struck, of equal speed. Mr. Stone apparently recognized this difficulty where he suggested that the pins m^2 might be spring-supported. The patent discloses no such construction, and, in my opinion, it would not mend matters. On the other hand it strikes me that this expedient would only increase the difficulty. When a spring is put into a base ball (in the form of an elastic core), the ball is driven further by the club, though the jarring shock of contact is taken off the club.

Mr. Stone, in his description of the Crist mechanism, as he presents it in Column 1 of Defendant's Drawing No. 7, altogether neglects to mention the important fact that the plate-formed fingers T T of said Crist mechanism operate solely by entering the open end of the bag blank. In fact he gives no description whatever of the general construction and operation of the Crist machine, and only in the most incidental way mentions the important fact that the tube upon which said Crist machine is intended to operate is an untucked tube. Whereas, in point of fact, said machine belongs to a substantially different art, to all intents and purposes, from the art of making diamonds upon tucked paper tubes in the formation of self-opening square-bottomed bags. Less than sixteen lines at the beginning of his answer on page 207, D. P. R., covers his entire description of Column 1 of Defendant's Drawing No. 7 and of the machine there referred to. Beginning in the sixteenth line, he says:

> "If we now *modify* the machine of the Crist patent, No.
> "543,571, by the substitution for each of the *former* plates
> "T T the presser plate 67, with its side fingers 82 and 83 re-
> "spectively, of the Lorenz & Honiss patent, No. 337,966,
> "and the front finger K^3 of the Cross patent, No. 222,464,
> "and further *modify* the said Crist patent by adding to the

"cylinder the side fingers 61 and 62 and the front clip 63 "of the said Lorenz & Honiss patent, No. 337,966, we *will* "*have* a machine such as is set forth in the figures of the "middle column of Defendant's Drawing No. 7." (Italics mine.)

He goes on to state that the so *much modified* machine of Column 2 of the drawing still lacks several enumerated and vitally important things, but adds that these "could be easily applied to machine by a mechanical engineer skilled in the art." With all these alleged modifications and unillustrated and unexplained additions, "the machine shown in the middle column "of Defendant's Drawing No. 7 *will*," he says, "be adapted to "not only perform the operation of the Crist machine * * * * "but *would be* fully adapted, with the aid of the two sets of "side fingers, for opening the forward end of a tucked paper "tube, and folding it down into a diamond form, for a self-"opening square bag." (Italics mine.)

As it strikes me, there is a great deal of specious fallacy in all this. First, in calling the supposititious machine of Column 2 of the Drawing "*Modified* Crist 543,571." I have heretofore read "Walker on Patents," but do not recall learning therefrom, or from any other source, that such a change in a machine as brings in new elements, gives it new capabilities, a new mode of operation, with new results, and enables it to operate upon different subject matter for producing a different product, is at all adequately defined as a "modification." Crist did not set out to make a machine for forming diamonds on tucked paper tubes, and he made no such machine. All he set out to do was to operate a mechanical finger to be thrust into the end of an untucked tube to open the diamond of a satchel-bottom bag. This he did, and it contented him. It was an element of his conception for this purpose that he must have *two oppositely arranged fingers* to act successively, one on one blank and the other on the next, as the opposite teeth of a horse hay rake gather the hay for and turn successive windrows. Crist has given us no idea, at least in this patent, of what his conception would be if he wanted to make a diamond-former

for bellows-folded tubes. What is shown in the middle column of Defendant's Drawing No. 7, disclaimed as to its origin by Mr. Stone, is apparently only Mr. Walker's recent conception of what Mr. Crist might have done if he had thought of it, Mr. Walker being moved to this exercise of his imagination by the exigencies of this suit.

Under these circumstances it seems to me of no consequence whether or not the alleged "Modified Crist 543,571" be practically operative or not, or whether what Mr. Stone says of it be true or not. It was non-existent at the date of the Liddell Patent, it clearly required invention for its production, and it, therefore, in my opinion, has no anticipating or limiting effect upon the Liddell Patent in suit. Patent Office Examiners are themselves often highly imaginative, and, after the submission of a new invention, often conceive of modifications in old machines which, in their opinion, rob the new one of patentability. But the Examiner who considered the Liddell application, and who had the entire art of paper bag making before him, saw nothing of the alleged possibilities of the Crist patent, 543,571, as now presented in the middle column of Defendant's Drawing No. 7, but, on the other hand, appears to have recognized Liddell's right to a clear field, allowing his claims without a scratch, as is shown by the File Wrapper and Contents, certified by the Patent Office, and here before me. And I never in my thirty odd years' experience before the Patent Office, as Prosecuting Attorney in more than two thousand applications for patents, knew of such a complicated and far-reaching reorganization of the showing of a prior patent, by an Examiner, to anticipate a new invention, as is here represented in the middle column of Defendant's Drawing No. 7.

Mr. Stone practically admits that the so-called "Modified Crist" machine would not without further modification or invention be operative at high speed. He says, at the middle of page 210, D. P. R.:

> "At high speed, the impact of the fork t against the pin "m^2, and the impact of the arm h^2 against the pin t^2, as "shown in Figure 4 of the middle column of Defendant's

"Drawing No. 7, will be somewhat severe and noisy; but "both of said pins could be spring-supported and the ma- "chine made to work smoothly, and without pound."

The fault is clearly more serious than stated by Mr. Stone, and the proposed remedy of less efficacy than he assigns it. It would, in my judgment, be only an aggravation of the fault. "A high speed" is just what a machine must have, and must have had at the date of the Liddell invention, to justify its existence alongside the machines now, and then, in commercial use. Wherefore, to say that a machine is incapable of high speed is practically to say that it is worthless. And that is the sentence in effect, pronounced by Mr. Stone, upon the so-called "Modified Crist" of Defendant's Drawing No. 7, when he admits that it is not adapted for high speed.

In my opinion the so-called "Modified Crist" machine would not be practically operative at any speed that would warrant it shop space in a bag factory.

The third column of Defendant's Drawing No. 7 contains representations of elements of the Liddell machine. Any fair comparison of said Liddell machine with anything else on the same drawing, must, in my judgment, be made with the figures of column 1, taken from the Crist patent. Such a comparison cannot be fully made, because the figures of column 3 omit mechanism for operating the forming-plate from its external and supporting axis synchronously with the movement of the cylinder. But comparing what is present in said third column with what is shown in column 1, it is evident that column 3 contains vital elements that are wholly absent in column 1, and that additionally the Liddell device of column 3 so far differs in its essential nature from that of column 1 that but a single oscillatory plate is necessary in Liddell where two revoluble plates are necessary in the Crist. Put with this the fact that the oscillatory plate of the Liddell machine is one having the function of creasing the blank, of lifting the upper ply, and of defining the triangle folds in the upper ply of a tucked paper tube, where the mere inside finger T of the Crist machine has no creasing function, and does not and cannot be provided with

devices for entering the side tucks and defining the triangular poles of the upper tuck of a tucked paper tube, and it is evident, to my mind, that the Crist machine and patent does not present the Liddell invention, or the subject matter of the Liddell claims in suit, or any approach thereto. As to the mere element of vibratory arms, common to both, such arms are old in numerous machines, and bear to the entire combination of the Liddell machine, as to that of the Crist machine, only the relation of such elemental matters as the lever and the wheel of rudimentary mechanics, to any of the infinite novel combinations in which they may be combined.

But I need hardly have made any comparison of the Liddell machine with that of the Crist patent, because defendant does not urge the Crist patent as itself having any bearing on the patent in suit. It is only the so-called "Modified Crist," as I understand it, that is so urged.

For the reasons above given, I am of the opinion that nothing in the Defendant's Drawing No. 7, or in the testimony relating thereto, has any operation to anticipate or restrict the Liddell invention of the patent here sued upon.

[*Adjourned (at 4.51 p. m.) until Wednesday, November 18, 1903, at 10.30 a. m.*]

Wednesday, November 18, 1903, 10:30 A. M.

[*Met pursuant to adjournment.*]

Present—The Notary and counsel as before.

[*Mr. Dayton continues his answer to Q. 257.*]

The foregoing covers all the *ex post facto* contrivances which, under the designation of "modifications," have been composed from a plurality of patents antedating the filing of the application for the Liddell patent in suit, and which I find to have been urged against said patent in suit.

Defendant's Drawing No. 8.

In Defendant's Drawing No. 8, however, enough reference is made to the prior art in connection with the Liddell patent to call for some consideration thereof at my hands and in answer to this question.

Column 1 of this drawing purports to show devices of the prior art, column 2 devices of the Liddell Patent, and column 3 devices of defendant's machine, which last need not be here discussed.

Fig. 1 of the middle or Liddell column of this drawing shows the cylindric, rotary bed or, more properly, the rotary series of beds of the Liddell Patent. Opposite this in the first or prior art column is placed a cylindric feed-roller taken, as Mr. Stone states (below middle of page 215) "from the Lorenz & Claussen machine [patent] No. 534512." This Lorenz & Claussen patent is avowedly for an invention described in the specification "in its adaptation to that class of machines such "as is shown and described in Letters Patent of the United "States, No. 417346, of December 17th, 1889," this patent referred to being the later of the two Stilwell patents introduced in evidence by defendant. By reference to the drawings on sheet 5 of the Lorenz & Claussen Patent, No. 534512, it will be observed that the cylindric feeding roller C of Fig. 1 of the prior art column in Defendant's Drawing No. 8 is the lowermost roller 11 of the pair numbered 11 and 12 in this drawing of the Lorenz & Claussen Patent, and by referring to the Stillwell Patent, No. 417346, the same rollers are shown on sheet 8 at G G′, respectively. Mr. Stilwell, who invented this type of machine, naturally knew what these rollers were for, and he states their character and purpose on page 2, lines 87, *et seq.*, as follows (with a little confusion in the use of designating letters):

> "G′ and G² (see Figs. 14 to 18 and Fig. 23) are *feed-*
> "*ing-rolls* through which the severed blanks are fed to
> "the mechanism which opens their bottoms. On the lower
> "roll G, or on the parts *g* secured to the same shaft G²,
> "are the gripping fingers *d* pivoted at *d*²," etc.

The lower roller G, answering to the roller C of Fig. 1 in the prior art column of Defendant's Drawing No. 8, is nowhere in the Stilwell Patent or in the Loewe & Claussen Patent referred to as a bed, though the Loewe & Claussen Patent does call it a cylinder. The Stilwell Patent from which it is taken repeatedly calls it a "roller" and "the lower roll G," and never calls it a "cylinder." On the same page 2 of the said Stilwell Patent, and at line 126 this patent says:

> "After issuing from between the rolls G G' [here correcting the error in the use of the letters] the top ply of "the blank," etc.

The lower "feeding-roller" of the Stilwell machine, which assists in delivering the "severed blanks * * * to the mechanism which opens their bottoms" is, like the cylindric bed shown in the Liddell Patent, provided with an end-clip and with two side clips for seizing the end of the lower ply and the sides of said ply, respectively; but this fact does not constitute said lower feeding-roller of the Stilwell machine a bed, as I have previously explained more fully in discussing the Stilwell patents and machine, and where I pointed out that said Stilwell machine has no bed at all. The juxtaposition of Fig. 1 in the prior art column and Fig. 1 in the Liddell column of Defendant's Drawing No. 8 is, therefore, in my judgment, calculated to mislead the court into the supposition that there existed in the art prior to the Liddell Patent the same cylindric bed, or series of beds, as that shown in the Liddell Patent, whereas this is not the fact at all. It is, of course, easy enough for a draughtsman, by drawing the lower feeding-roller of the Stilwell Patent of the same size as the cylinder of the Liddell Patent, carrying a series of beds, to give the impression of identity where no identity in fact exists. The feeding-roller G of the Stilwell Patent, 617386, copied at 11 in the Loewe & Claussen Patent, 324572, must, in the type of machine shown in both these patents, be limited in dimensions exclusively to the proposed length of a single bed, whereas the cylinder C of the Liddell Patent may be made of any size giving a circumference which is a multiple of the length of a bed.

In Fig. 2 of the middle or Liddell column of Defendant's Drawing No. 8 is shown the forming-plate E of the Liddell patent in suit with its end finger E′ and side fingers H, and in Fig. 2 of the prior art column is shown the forming-plate of the Lorenz & Honiss Patent, No. 337966, with its end finger 84 and side fingers 82. These end and side fingers are not alike in detail, but I agree with Mr. Stone that they are the equivalents of each other. The difference between the two forming-plates, thus presented detached from their respective machines, is that the forming-plate of the Lorenz & Honiss Patent, 337966, has its sole axis at and in line with its creasing edge, as shown by the circle at the left hand end of Fig. 2 in the prior art column of this Defendant's Drawing No. 8, while the forming-plate E of the corresponding figure in the Liddell column of the drawing has a second axis additional to its working axis on its edge, which second axis is remote from the working or creasing edge of the plate, as shown by the circle at the right-hand edge in this figure of said drawing, No. 8. The full significance of this difference does not appear in the detached showing of the forming-plates, and appears only in the comparison of the two machines containing them respectively, which comparison I have already made and need not here repeat.

The inference is clear that if the prior art contained any such forming-plate as that of the Liddell Patent, namely, with a creasing edge for one of its axes and a second axis remote from this edge and with side fingers or with end and side fingers, it would have been shown in the prior art column of this Defendant's Drawing No. 8 in place of that shown in column 1 of said drawing. And the inference accords precisely with the fact. There is no such forming-plate in the prior art.

In Fig. 3 of the Liddell column of Defendant's Drawing No. 8 are copied the arms, cams, and wheels shown in the Liddell Patent as the means for actuating the double-axised forming-plate of the Figure 2 above it when mounted over the rotating cylinder C of Figure 1 above it, it being ununderstood that the axis of the forming-plate which is remote

from its creasing edge is identical with the axis of the wheel N in Fig. 3, and that the forming-plate is actuated through the train of gears and cams shown in the drawing.

[*Recess.*]

Of this Fig. 3 in the Liddell column Mr. Stone says (page 217):

> "For the aggregation [he had previously called it an "an 'element' on page 214] set forth in Figure 3 of the "middle column of Defendant's Drawing No. 8, I am un- "able to find an equivalent in the prior art, and believe "that Liddell should be accorded unquestioned right "in the language of the claim, to these 'operating means "for the forming-plate, adapted to cause the said plate "to oscillate about its rear edge."

He omits the further language of the claim, "upon the surface of the cylinder." And he does not state half the fact. There was never any such forming-plate to be so operated by any means, and there was never any means whatever for so operating a forming-plate. The double-axised, creasing, and finger-equipped forming-plate of the Liddell patent, adapted for folding the diamond on a tucked paper tube, was new in itself; was new in the combination with a rotary bed, where its usefulness is obtained, and it was new in combination with such a bed and any means whatever for operating it. Hence the broad and generic terms of the Liddell Patent claims, allowed by the Patent Office without a single objection. And hence the absolute blank in the prior art column opposite said Fig. 3 in the Liddell column of Defendant's Drawing No. 8.

The comparative Figs. 4 in the Liddell and Prior Art columns of Defendant's Drawing No. 8 call for only the briefest mention. They represent the naturally different connections between different forms of fingers on a forming-plate, and different forms of cams for actuating such different fingers. I agree with Mr. Stone that in these mere details the Liddell Patent presents nothing vitally new or valuable. The Liddell invention strikes deeper, and far below the superficial stratum

in which such small crops sprout. Liddell has chosen to show a particular form of acting fingers on the forming-plate E, but he has not restricted his claims thereto, well-knowing, evidently, that other forms were known in the art and that they could be changed without in the least affecting in any way the essential principle of the invention, and that constructors could vary the forms of the means for actuating said fingers almost *ad infinitum*, either with or without variation of the fingers themselves. The terms of the claims in suit are, therefore, most generic, being "a forming-plate also provided with side "forming fingers adapted to be moved toward or from each "other, means for operating said fingers at definite times dur-"ing the formative action upon the bag tube."

I, therefore, regard Defendant's Drawing No. 8 as a distinct recognition of fundamental novelty in the invention of the Liddell Patent in suit, though, in part and as concerns Fig. 1 of the Prior Art and Liddell columns, an attempt to show in the Prior Art an element corresponding to the bed-carrying cylinder of the Liddell Patent, where no such corresponding element existed.

Tucker Plates in General.

In Q. 35, page 236, D. P. R., Mr. Stone was asked to state where a tucker plate turning on a stationary axis midway between its edges, originated in the art of paper bag machinery. This, in a way, involves the case of a tucker or folding-plate having a second axis remote from its creasing edge, and it is, therefore, appropriate for me to consider Mr. Stone's answer to that question under the present interrogatory.

In his reply Mr. Stone points out eleven patents which contain what he calls tucker plates or former plates, and to some of which these terms do not apply at all. Some of such so-called former plates also do not respond to the specification of the question he was answering. One of them, moreover, was that of the Liddell Patent in suit, No. 558,969, and two others belong to the Claussen and Claussen & Mortsen Patent, numbered respectively 598,497, and 635,090, both filed subsequent to the issue of the Liddell Patent in suit, and under both which it is contended that defendant's machines are built.

Mentioning the eight instances given by Mr. Stone, prior to the filing of the application for the Liddell Patent in suit, they are as follows:

First, the Lorenz & Honiss Patent No. 337,965, which Mr. Stone says is "the earliest that I find," and of which he says further that "this tucker plate has a rising and falling movement only, in a plane substantially parallel to the travel of the blank." To have stated the full fact he would have said that this tucker plate has no axis of motion whatever. It is merely a presser-plate. Turning to sheets 1 and 2 of the drawings of this patent, it will be seen at 51 lying flat upon the blank bag tube with its front edge in position to have the upper ply folded backwardly over it. It always lies flat. It is merely lifted uniformly throughout its width to let the blank under it and then is lowered to press the blank down while other devices fold the upper ply over.

This, then, has no bearing on the folding-plate E of the Liddell Patent in suit.

Second. The Lorenz and Honiss Patent, 337,966, in which Mr. Stone states correctly "is found a tucker plate vibrating upon a fixed axis coincident with its defining edge." This patent and its tucker plate have already been considered and, even on Mr. Stone's statement, it has no second axis remote from its creasing or defining edge.

Third. The Lorenz & Honiss Patent, No. 361,951, in which, as Mr. Stone correctly states, "is found the rising and falling tucker plate like that of Lorenz & Honiss Patent No. 337,965." This, then, may be dismissed.

Fourth. The Lorenz & Claussen Patent, No. 410,841.

Fifth. The Lorenz & Honiss Patent, No. 410,842. Both the fourth and fifth are stated by Mr. Stone to have the same sort of tucker plate as that of the Lorenz & Honiss Patent, No. 337,965, namely, without any rotation whatever, and, therefore, without even a single axis of rotation. These, then, may be dismissed.

Sixth. The Patterson Patent, No. 446,839, in which Mr. Stone says "is found a tucker plate oscillating upon a pivot remote from its forming edge, and which performs similar functions to the rising and falling tucker plate of Lorenz & Honiss, No. 337,965." This patent might also be dismissed from consideration in view of this statement of Mr. Stone, but I choose to point out the actual facts more fully and exactly than Mr. Stone has done, for the better understanding of the facts by the court.

Calling attention to Fig. 1a, sheet 1, Fig. 2a, sheet 3, and Fig. 9, sheet 5, it will be observed that the tucked blank pursues a horizontal course through the machine, having within it a longitudinally reciprocatory bar D^2, best shown in Fig. 9, the front end of which is widened and passes within the blank below the side tucks thereof, the extremity of the widened part D' being cut off at its sides to give the triangular shape of the front flap of the diamond. The tucker plate is shown at G, being like the curved blade of a hoe, and fastened, like the blade of a hoe to its handle, to an arm g which is pivoted at its opposite end in an elevated position. The specification says, page 2, line 50, *et seq.:*

> "After passing through the last cutting rolls the blank "is delivered to the angular former D′ in such a way that "the oblique edges dd^2 of the said plate shall lie on the "under ply of the blank in line with the creases B^3 formed "thereon by the roll F F. The cam d^{16} then operates "* * * to first push said rod and the plate D′ upon its "end forward, and simultaneously with this forward mo- "tion of the rod and plate the tucker G and [independ- "ently mounted] fingers H H come into operation. The "said tucker G is fastened to the end of an arm g which is "pivoted on a shaft g' * * * given an oscillating "reciprocating movement. It [the tucker G] is formed and "actuated so as to come down upon the blank along the "line B^5, Figs. 9, 10 and 11, upon which the diamond is "spread out, and to move forward with the blank and the "plate D′, maintaining its position upon it approximately "upon said line B^5 until the diamond is substantially de- "fined."

Now it will be clear, I think, that the tucker of this Patterson Patent is essentially only a reciprocating tucker, practically like that of the Lorenz & Honiss Patent, 337,965, following along upon the blank, while the upper ply is being turned back over its front edge by devices, also advancing with the blank but having no support upon or mechanical connection with the tucker plate. It is only mounted to oscillate endwise, and, therefore, has no correspondence with the tucker plate or forming-plate E of the Liddell Patent with respect to mode of operation, otherwise than that its edge, like all tucker plates, defines the main transverse line of fold in the diamond.

There remain only two more citations made by Mr. Stone in answer to Q. 35, and these both relate to machines for making satchel bottom bags from untucked tubes. They might, therefore, in the very nature of things, be dismissed as by no possibility having any pertinence to the Liddell Patent in suit. But considering them in the order in which they are mentioned by Mr. Stone:

Seventh, the Crowell Patent, No. 510410, in which Mr. Stone says, "is found a tucker plate turning upon a pivot coincident with its defining edge." He might have added something more to this statement with a degree of plausibility. Briefly explaining the Crowell construction, a string of partially severed but still connected bag blanks are passed over a stationary bar 22, Figs. 3 and 4, and drawn therefrom along a horizontal table or bed 39. In the passage of the paper towards the roller and table the upper ply is moistened along a transverse line where said upper ply is to be folded back upon itself. The stationary bar 22 slightly lifts the blanks as they pass over it, causing the upper ply to rise from the lower ply beyond the deflecting bar. Over the table and above the blank there rests upon the latter a light, skeleton frame composed of two parallel bars 23 and 34, connected at their ends by spacing bars or plates 26. Centrally on each transverse bar 23 and 24 is secured a finger, one marked 30 and the other 31, each of these fingers projecting towards the opposite bar, and with its free end a little distant from the latter, so that the lower of said fingers, resting on the paper traveling beneath it may enter the end

of an approaching blank, precisely as was pointed out to be the case with respect to the opposite plate-formed fingers T T of the Crist Patent, previously discussed in connection with Defendant's Drawing No. 7. The skeleton frame, composed of the transverse bars 23 and 24, and the oppositely arranged and directed central fingers 30 and 31, is held in place for such insertion of one of the fingers into an approaching bag blank by means of side links 27, pivoted to the end bars 26 of the skeleton and to stationary points 28 on the frame of the machine. When a bag blank has advanced far enough over the finger 30 or 31 (whichever happens to be lowermost), vibratory bars 32, moved by a cam 34 and link 33, push against the prolonged ends of the cross-bar 23 or 24 beneath which the upper ply of the blank has passed over the subjacent finger, and move the frame along in the direction in which the blanks are traveling. The side links 27, however, tend to hold the frame back, with the result that the frame rises from the position shown in Fig. 4 to the position shown in Fig. 5, and in rising lifts the top ply of the blank by the inside finger, while the bar engaged by the levers 32 bears upon the upper ply along the moistened line of the blank, and defines the cross fold. When the skeleton frame has been lifted to a vertical position the pushing levers 32 are retracted and the lower bar of the frame is further moved forward by its contact with the blank. When thus moved far enough at its lower edge the frame tumbles over backwardly to its original position, carrying the top ply of the blank with it. In this operation just described the finger-carrying frame has been turned the other side up, bringing the finger which was before uppermost to the bottom ready to enter the mouth of the next blank.

From his neglect to mention the pivoted side links 27, I judge that Mr. Stone recognized the fact that these links do not support the frame carrying the fingers, except partially, and only when they act to hold back the frame against the action of the pushing levers 32 which advance the adjacent and lowermost cross-bar of the frame. The Crowell device, like the Crist device for the same purpose, as pointed out in connection with Defendant's Drawing No. 7, is necessarily a double

fingered device, making a half revolution at each operation, and consequently requiring two operations upon two successive blanks to bring either of its fingers back to its original position. Manifestly, in my opinion, the Crowell "tucker plate" or central fingered frame presents no analogy to the tucker or former-plate E of the Liddell Patent with its side fingers for entering the side tucks of a bellows-folded tube and forming the triangles peculiar to the diamond made on tucked tubes, and not present in the diamond formed on untucked tubes. Evidently defendant's counsel has regarded it as less pertinent than the device of the Crist Patent for the same purpose.

Eighth. The Crist Patent, No. 543,571, of which Mr. Stone says that it has "a tucker plate also turning upon a pivot, opposite to its defining edge." It has already been demonstrated that the plate-formed fingers T T of the Crist Patent enter the end of the tubular blank, that the ends or edges of said fingers do not bear upon the upper ply of the blank to be folded, and that, therefore, said fingers do not "define" the fold, or have any "defining edge." It was also pointed out in considering Defendant's Drawing No. 7, that the creasing of the upper ply for the definition of the transverse fold in the Crist machine is done by a blade on the roller P, acting upon the blank before it reaches the point where the fold is to be made by one of the fingers T, and that, therefore, neither of said fingers T has anything to do with the creasing or definition of said fold.

It turns out from the foregoing that no one of the eight tucker plates cited by Mr. Stone in answer to Q. 35, page 236, D. P. R., corresponds with the double axised tucker plate of the Liddell Patent in suit, even when the latter is considered entirely by itself and without reference to the novel combination in which it is found in said Liddell Patent. And from the consideration above given to the entire Prior Art as presented by defendant in its testimony and exhibits, it seems to me evident, and it is my opinion, that the invention set forth in the Liddell Patent and specified in the claims thereof in suit, is neither anticipated nor restricted by such Prior Art.

[*Defendant's counsel objects to the foregoing answer, of more than fifteen thousand words, to Q. 257, on the four grounds upon which that question was objected to; and also, because the answer is essentially a partisan argument based upon some portions of the evidence of the defendant; and because the answer contains but little evidence of its own, which little is so diluted and lost in the partisan argument that it can hardly be found by searching; and because the answer is so long and so complicated that it does not admit of being subjected to fair and useful cross-examination on the few matters of evidence which it contains.*]

451 Washington Street, New York City, Monday, November 16, 1903, 1 P. M.

[*Met pursuant to adjournment.*]

Present—The Notary; SAMUEL R. BETTS, Esq., of Counsel for Complainant; ALBERT H. WALKER, Esq., of Counsel for Defendant; and the Witness, Mr. M. E. DAYTON.

[*Complainant's counsel desires the notary to certify that this evidence is being taken in the presence of the machine which bears a tag marked in this suit, and also in the suit against the Woodward & Rogers Company, as "Complainant's Exhibit Operative Machine of Liddell Patent in Suit." November 10, 1903, J. J. C., Notary Public."*]

[*The Notary so certifies.*]

[*Complainant's counsel states that there are here present, at the request of complainant's counsel, Mr. William A. Lorenz and Mr. Joseph Merritt, to operate the paper bag machine above referred to.*]

[*Complainant's counsel also desires it noted that there are also present Mr. Wilbur M. Stone, who testified as an expert on the part of defendant herein, and Mr. Charles F. Smith, who was called by complainant on its opening case herein, and who is mechanical expert for the Continental Paper Bag Company, the defendant herein.*]

[*Complainant's counsel now offers the machine, the exhibit in this case, for the inspection of defendant's counsel and the two experts mentioned, on the part of defendant, and in its*

present state of rest; and requests the notary to certify that Messrs. Stone, Smith and Walker are looking at the machine.]

[*The notary so certifies.*]

Q. 258. Mr. Dayton, this machine, "Complainant's Exhibit Operative Machine of Liddell Patent in Suit," will now be run operatively by Mr. Lorenz and Mr. Merritt, in your presence, the instructions being to make runs of the same number and under the same circumstances, as nearly as possible, as the runs made on November 5, 1903, on this machine, before your evidence was commenced, and about which you have testified, and specimens of which have been marked in evidence on the part of complainant. I desire you to note closely the operation of the machine and the results thereof in the shape of bags, and be prepared to testify as to anything which goes on under your observation; and ask you, in answer to this question, to state whether such operation has been conducted and completed before your answer begins, and whether or not it has been a repetition of the performance testified about by you as occurring on November 5, 1903.

[*Defendant's counsel objects to this question, because the machine upon which the experiment is proposed to be made is substantially out of conformity to the Liddell Patent, and is therefore immaterial to the suit.*]

[*Complainant's counsel requests the notary to particularly observe the product of the machine in the shape of paper bags, which will be run out on three different thicknesses of paper in his presence, and to the extent of two thousand bags of each thickness, and an additional one thousand bags at a higher rate of speed, and to so arrange that he will be able to keep those runs of bags in his custody, if necessary, and identify them as run out in the presence of the counsel and the witness on this particular occasion.*]

[*The notary hereby certifies that the machine referred to was then operated in his presence and in the presence of the various persons heretofore noted as appearing upon this occasion; the operation being conducted under the direction of Mr. William A. Lorenz; the first run resulting in the product*

of about two thousand bags of Lion paper, and one of the first hundred of such bags being marked by the notary "A. B. C., Nov. 16, 1903, 1st 100 Lion," and one of the last hundred of such bags being marked by the notary "A. B. C., Nov. 16, 1903, last 100 Lion;" the second run resulting in a product of about two thousand bags of Buffalo paper, and one of the first hundred of such bags being marked by the notary "A. B. C., Nov. 16, 1903, Buffalo 1st 100," and one of the last one hundred of such bags being marked by the notary "A. B. C., Nov. 16, 1903, Buffalo last 100;" the third run resulting in a product of about two thousand bags of Elephant paper, and one of the first hundred of such bags being marked by the notary "A. B. C., Nov. 16, 1903, Elephant 1st 100," and one of the last one hundred of such bags being marked by the notary "A. B. C., Nov. 16, 1903, Elephant last 100;" and the run at a higher rate of speed resulting in a product of one thousand bags of Lion paper, and one of the first hundred of such bags being marked by the notary "A. B. C., Nov. 16, 1903, 140 speed, 1st 100," and one of the last hundred of such bags being marked by the notary "A. B. C., Nov. 16, 1903, 140 speed, last 100,"]

[Defendant's counsel admits that the so-called Liddell machine has been operated in his presence, and in the presence of the defendant's experts Stone and Smith, to-day, November 16, 1903, in substantially the same way that it is said in the former deposition of Mr. Dayton to have been operated in the absence of defendant's counsel, on Nov. 5, 1903, and that the results of said repeated operations to-day, in respect of the number and quality of paper bags, are substantially the same as the result testified to by Mr. Dayton in his former deposition in respect of the performance of November 5, 1903.]

[Complainant's counsel, in view of the above admission on the record by defendant's counsel, and as he has already offered in evidence paper bags representative of the results of the operation of November 5, 1903, will not now offer in evidence any specimens of the bags resulting from to-day's operations, in order not to encumber the case with too large a number of exhibit bags, but requests the notary in some way to have to-day's product laid aside, so that if, at any future stage of the

case, it may seem necessary to offer some part of it, it may be possible to identify such product.]

[*The notary states that he has arranged with Mr. Lorenz to preserve the product referred to, two bags of each lot having been marked by the notary as above stated.*]

[*Defendant's counsel now requests that the complainant's counsel shall authorize and direct either of the five or six experts now present, including the complainant's experts, Dayton and Lorenz, to unscrew the single bolt and the single screw which hold the carrier of the flattening-plate to the arm which works the flattening-plate, so as to remove from the so-called Liddell machine that flattening-plate, which is shown in complainant's Photo No. 5, hovering over the paper bag below it; and defendant's counsel requests the complainant's counsel, after that flattening-plate has been thus removed, to authorize and direct the same experts that have been running the machine this afternoon, to run the machine in the same way, on the same paper, without that flattening-plate, so that the court may learn what the machine will do when that flattening-plate is absent therefrom; and to that end, the defendant's counsel requests that the first hundred bags, or the first two hundred bags, or the first thousand bags, that shall result from the proposed operation, may be either now put in evidence by complainant's counsel, or carefully counted and turned over to Mr. Wilbur M. Stone, one of the defendant's experts, so that they hereafter may be proved and put in evidence in a deposition to be given by Mr. Stone.*]

[*Complainant's counsel asks defendant's counsel if the objection he seems to have to the flattening-plate in this machine referred to, is confined to that particular flattening-plate or form of flattening-plate, or extends to any flattening-plate in that machine, and in a similar location, substantially.*]

[*Defendant's counsel replies that the machine has been put in evidence in a particular condition, presumably pleasing to complainant, and defendant's counsel's request at present is confined to simply removing from that machine one part, that can be removed in one minute, without interfering with any other part of the machine, and then running the machine without that part. The defendant's view of the propriety of this*

test is based upon the fact that the Liddell Patent in suit contains no description, suggestion, or intimation of any such flattening-plate, or any flattening-plate, but, on the contrary, negatives the occasion or necessity for any such device in the Liddell machine. Therefore the flattening-plate in question is undeniably a matter of addition, and the court is entitled to know whether that addition is indispensable or is not indispensable to the operativeness of the Liddell machine; and that knowledge can be put on record now, once for all, in less than half an hour, if the complainant's counsel is willing to have the court informed upon that question.]

[*Defendant's counsel states that, in his judgment, the addition of that flattening-plate was totally illegitimate, and that it would be totally illegitimate to add to the Liddell Patent any flattening-plate whatever, in the place of the flattening-plate now asked to be removed, because there was no flattening-plate known to the art prior to the application for the Liddell Patent, which can by any possibility perform the function of the flattening-plate asked to be removed for the purpose of the present trial.*]

[*Defendant's counsel adds, for the guidance of complainant's counsel, that if the present request is granted, and if the present flattening-plate is removed, and if thereupon the Liddell machine is found to be inoperative without that flattening-plate, it will be open to complainant's counsel to afterwards add to that machine some flattening-plate that he can find in the art prior to February 7, 1896, and then prove how the machine will work with that old flattening-plate. At present the simple and reasonable request is to inform the court how the present machine will work without the new flattening-plate which has been added to it, in the year 1903, by the most skilful paper bag machine expert in the whole world, of his own invention, and without any assistance or suggestion whatever from the Liddell Patent.*]

[*Complainant's counsel objects to such portion of above statement as consists of expert testimony by Mr. Walker, on the ground that it is incompetent and out of defendant's time for testimony, and objects to so much of the above statement of*

Mr. Walker attempts to argue the case upon said exhibit testimony, on the ground that the final hearing of this case is not reached; and replies that the complainant considers the patentee-part [illegible] part thereof, but if complainant does make any change in the machine and does operate it in any such changed form, and desires to take testimony about such operation, complainant will give defendant's counsel due and timely notice thereof; but nothing in that respect will be done at the present moment.]

[Adjourned to Tuesday, November 17, 1903, at 10:30 A. M., at 120 Broadway.]

Thursday, November 19, 1903.

[Met pursuant to adjournment.]

Present—The Notary and Counsel as before.

[Complainant's counsel offers in evidence a certified copy from the U. S. Patent Office, of the File Wrapper and Contracts, in the matter of the Letters Patent of William Liddell, No. 528,9629, granted April 26, 1898, for improvement in paper bag machines, and the same is marked "Complainant's Exhibit File Wrapper and Contracts Liddell Patent in Suit."]

[Defendant's counsel objects to the reception of papers last offered in evidence as not being the best evidence at common law of the different documents of which the exhibit purports to contain copies, and as being inadmissible, even under the statute, as conclusive evidence of the contracts and character of the application in pursuance of which the patent in suit was granted.]

Q. 259. Please consider defendant's exhibits marked "Chenoweth Patents, Nos. 1, 2, 3, 4, 5, and 6," now submitted to you in connection with the testimony of Mr. Edward E. Chenoweth, when called as a witness on the part of the defendant, and also consider said exhibits and defendant's testimony in connection with the United States Letters Patent to said Chenoweth, No. 577,059, dated November 30, 1896 (application filed July 18, 1896), and No. 596,297, dated Feb. 6, 1898 (applica-

tion filed July 29, 1896), this last being an exhibit on the part of defendant herein, and consider all the above also in connection with the Liddell Patent in suit, and state whether or not, in your opinion, the original sketches included among said defendant's Claussen exhibits contain or disclose the invention set forth in said Liddell Patent in suit, and particularly defined in Claims 1, 2 and 7?

[*Defendant's counsel objects to this question on the following grounds:*]

[*First. The question calls for an opinion of the witness, to be based upon a large amount of evidence in the record, and partly upon one patent which is not in the record, instead of calling on the witness for testimony upon points of fact proper to be given on rebuttal to the defendant's evidence.*]

[*Second. The question calls for an opinion in the negative or in the affirmative, as the case may be, upon a subject on which no negative and no affirmative evidence is contained in the defendant's record, and thereby calls for statements which, whatever they may turn out to be, will not rebut anything in the defendant's record.*]

[*In support of the second ground of objection; defendant's counsel calls attention to the fact that neither the defendant, nor the defendant's counsel, nor any expert of the defendant, ever took the ground that the original sketches referred to in the question (namely, Claussen Exhibits Nos. 1, 3 and 5) contain or disclose the invention set forth in said Liddell Patent in suit, and particularly defined in Claims 1, 2 and 7 of that patent; but that the defendant, and the defendant's counsel, and defendant's experts, take a very different ground relevant to those original sketches, namely, that they represent the beginning and some of the early stages of the development of the invention of the Claussen Patent, 598,497, of February 8, 1898, and have no more relevancy to the Liddell Patent in suit than that Claussen Patent has, except that Claussen Exhibits 1 and 5 were made before anybody made the invention of Claims 1, 2 and 7 of the Liddell Patent, and except that Claussen Exhibit No. 3 was made before the Liddell Patent was applied for.*

A. I have very carefully examined said sketches and the

testimony of Mr. Claussen concerning them, and I have also with equal care examined the testimony of Mr. Stone, defendant's expert, given particularly in his answer to Q. 28, running from pages 221 to 232, inclusive, of defendant's printed record, wherein Mr. Stone considered the Claussen Exhibits, Nos. 1, 3 and 5, in connection with Defendant's Drawing No. 9, which purports to represent, in column 1, the construction supposed to be indicated in Claussen Exhibit 3; in column 2, the construction shown in the Claussen Patent, No. 598497, and in column 3, features of construction belonging to defendant's machine charged with infringement of the Liddell Patent sued upon in this case.

I first call attention to the fact that, in the question now asked me, I have submitted to me a patent to Claussen, to wit No. 574020, dated December 18, 1896, and filed July 18, 1896, which was eleven days prior to the filing of the application for the Claussen Patent, No. 598497, which latter was the only Claussen Patent submitted by defendant's counsel to Mr. Stone in the question 28, above referred to. And I wish to point out (here only mentioning the fact) that said first applied for Claussen Patent has a more direct relation to the Claussen Exhibit sketches than the later patent submitted to Mr. Stone, and especially that Fig. 2 of said Claussen Patent, 574020, bears a very close resemblance to Fig. 1 of the drawing "Claussen Exhibit No. 3."

But first considering the tracings, Claussen Exhibit No. 6 (which is a tracing of Claussen Exhibit No. 5), the tracing Claussen Exhibit No. 2 (a tracing of Claussen Exhibit No. 1), and Claussen Exhibit No. 3, I begin by assigning to these several exhibits the dates claimed for them in defendant's testimony, this being thought advisable because the exhibits are not numbered in the order of their generation. Thus, I understand, Claussen Exhibits Nos. 5-6 to be given the date of November 6, 1895; Claussen Exhibits Nos. 1-2 to be given the date of November 22nd, 1895; and Claussen Exhibit No. 3 to be given the date which it bears, to wit: January 17, 1896. This arrangement of dates puts the Exhibits Nos. 5-6 before Nos. 1-2, Exhibit No. 3 following Exhibits Nos. 1-2, as in the order of their original presentation.

The testimony goes to show that these several exhibits, Nos. 5-6, Nos. 1-2, and No. 3 picture the first glimmerings of a paper bag making machine, but it is evident that neither of the exhibits shows anything like a matured conception of an operative mechanism, or of a combination of co-operating parts to that end. The one single thing, or part, which appears to have been conceived with some degree of definiteness is a tucker-plate having a supporting axis remote from its working edge, for this appears as the one and only distinct thing common to all these three exhibits. What is called a Vee plate is additionally shown in Claussen Exhibits 5-6, and in Claussen Exhibit 3, the same being marked *y* in two places on Claussen Exhibit 6, and 11-12 in Exhibit 3. These two parts, to wit: the tucker-plate and the Vee plate, appear to go together, as being included in the basic idea of the new process of making bag bottoms previously conceived by Mr. Claussen and referred to in the lower right hand corner of Claussen Exhibit No. 3, where I find these words:

"PAPER BAG MACHINE.
"for Process ('Case A) dated November 4-95."

[*Adjourned to Friday, November 20, 1903, at 10:30 A. M.*]

Friday, November *20, 1903.*

[*Met pursuant to adjournment.*]
Present—The Notary and counsel as before.
[*Mr. Dayton continues his answer to Q. 259.*]

In Claussen Exhibits Nos. 1-2 the Vee plate present in the other two Claussen Exhibits is not present, and this particular sketch (which I will hereafter speak of as Claussen Exhibit No. 2), does not appear to refer at all to the alleged new process or to the manufacture of the new bag bottom resulting from said new process. And it should be noted that the said new bag bottom of the new process is different in many important respects from the regular self-opening square bag bottom, known as the Deering bag, so different in fact that Mr. Claussen states in his testimony that the proposed mechanism shown in Claussen Exhibit No. 6 (same as No. 5) and in Claussen Exhibit

No. 3 will not make a Deering bag (see answer to x-Q. 354). On the other hand, Claussen Exhibit No. 2 appears to relate to devices for making a Deering bag. Hence the sketches divide themselves into two classes, for two different kinds of machines for two radically different kinds of operations and products. That is to say, Claussen Exhibit No. 5 or 6 (same thing) and Claussen Exhibit No. 3 pertain exclusively to the "new process" bag bottom, and Claussen Exhibit No. 2 exclusively to the regular Deering bag bottom. The machines concerned in this controversy being machines exclusively for manufacturing the Deering bag bottom, it would seem, therefore, that only the Claussen Exhibit No. 2 has any relevancy to this case, and that Claussen Exhibits Nos. 6 and 3 have and can have no relevancy to this case. And in my judgment this conclusion is not discredited in the least by the fact that a similar tucker-plate is proposed for both these different kinds of machines. The tucker-plate alone is inefficient for any purpose; it depends upon with what it is combined and upon how it operates in such combination, what its effect and efficiency may be, and what is the resulting nature of the machine.

But the essential dissimilarity and complete distinction between the proposed machine of Claussen Exhibits Nos. 6 and 3, on the one hand, and that of Claussen Exhibit No. 2, on the other hand, is fully recognized by Mr. Claussen himself in his answer to r-r-d-Q. 443, where he says:

> "Having finished my sketch of November 6, 1895, as "shown in Claussen Exhibit No. 5 (same as No. 6) I then "made the invention of November 22, 1895, of Claussen "Exhibit No. 1 (same as No. 2); and so that I "could preserve these inventions [note the plural] "I proceeded, on November 23, 1895, to make "Claussen Exhibit No. 3, which I finished on "January 17, 1896. While at work upon this drawing "and carefully considering the advisability *which form "of bag I should take up*, either the Deering bag as shown "in Claussen Exhibit No. 7, or the style of bag shown in "Claussen Exhibit No. 4, I finally decided to adhere to the "style of bag as shown in Claussen Exhibit No. 7, for the "reason that that was the bag which had been tested and

"found to be a bag well adapted to the commercial trade.
"In February I then started to make Patent Office Draw-
"ings of my application filed July 29, 1895, [should be
"1896], Serial number 600,861, which case was allowed
"and now bears the number 598,497." (Italics mine.)

The foregoing is Mr. Claussen's full answer, and in it he makes no reference whatever to his preparation of the application, filed July 18, 1896, for the patent, No. 574,020, which is the direct outcome, as appears manifest on its face, of sketches Claussen Exhibits Nos. 5-6 and 3. The filing of the application for this last-mentioned but first-issued patent, eleven days prior to the filing of the application for the patent which he mentions (589,497), would indicate that he first prepared his application for the machine with which to make the new process bag, said to be shown in "Claussen Exhibit No. 4," instead of the application for making the regular Deering bag of Claussen Exhibit No. 7. It is, of course, to be assumed that his memory was at fault in giving the above quoted answer, and Mr. Walker does not appear to have brought to his attention the patent, No. 574,020, any more than he brought it to the attention of his expert Mr. Stone.

Claussen Exhibits 5-6 and 2, and Patent 574,020.

Before taking up Claussen Exhibit No. 2 (November 22, 1895), and comparing it with the Liddell invention as embodied in defendant's machine, I will further comment upon Claussen Exhibit No. 6 (November 6, 1895), and Claussen Exhibit No. 3 (January 17, 1895), and will compare them with the Claussen Patent, No. 574,020, which shows what Claussen finally reached from his beginnings with these sketches and with the aid of the Liddell Patent in suit, which Mr. Claussen testifies, I believe, that he examined upon its issue.

I have pointed out that the Vee-plate is a characteristic feature in Claussen Exhibit No. 6 and in Claussen Exhibit No. 3. Turning to the specification of the Claussen Patent, No. 574,020, the use therein of a block letter "V," to designate this Vee plate, enables the eye to readily observe how frequently it is mentioned and the prominence it occupies in the description

and claims. Noting the claims particularly, it will be seen that the Vee plate is an element in every one of them. Said claims are literally blotched with the black letter V. It occurs not less than twice in any claim, and in several it occurs four or five times. The significance of this fact is that the V-plate of the sketches, Claussen Exhibit No. 5-6, and of Claussen Exhibit No. 3, forms the underlying feature of the machine Claussen had in mind in making these sketches, and in the further fact that such machine was not intended to make a Deering bag, but the new process bag which Claussen had devised and which he purports to show in Claussen Exhibit No. 4.

Turning to Fig. 2, Fig. 5, and Fig. 7, and comparing them with Fig. 1 of Claussen Exhibit No. 3, there will be seen at 82 in the patent drawings precisely the same V-plate, that is shown at P in said Claussen Exhibit No. 3.

[*Recess.*]

In Claussen Exhibit No. 3 the inclined edges of said V-plate which converge at a right angle to each other are marked 11 and 12, and in the patent they are marked 84 and 85. This V-plate has no advancing or rocking motion whatever. In Claussen Exhibit No. 3 it is shown fixedly secured by two screws at each end to the frame of the machine. In the patent, No. 574,020, it is fixedly secured to a pair of horizontal arms which rise and fall, this being a feature directly traceable to the Liddell Patent in suit. In both Claussen Exhibit No. 3 and Claussen Patent, No. 574,020, a tucked paper bag blank is fed under this horizontal V-plate just far enough to bring the front edge of the upper ply beneath and opposite the points which form the front end of the V-plate. The corners of the upper ply, therefore, project beyond the inclines of the V-plate and these corners, when the blank reaches the position mentioned, are to be turned over on to the top of the V-plate, and there held by the fingers. These fingers are marked 16, 16, in Claussen Exhibit No. 3, and 111 and 112 in Claussen Patent, 574,020. The fingers, therefore, hold to the V-plate not only the corners of the upper tuck thus turned over upon the plate, but also that por-

tion of the upper ply which lies under the points of the V-plate, constituting a cross strip of the upper ply as wide as the depth of the turned over corners. The body of the blank, including the lower ply, which is clamped at its front end to a cylinder, as shown in Figs. 5 and 6, of the Claussen Patent, No. 574,020, is free to move forward, while the portion of the upper ply above mentioned is thus held fast to the V-plate. The tongue at the end of the lower ply is carried forward by the clip on the moving cylinder and the body of the blank is whipped downwardly, forwardly and upwardly by the tucker-plate, marked 102 in the patent and P in Claussen Exhibit No. 3. The side fingers which have held the turned over corners of the upper tuck and the intermediate portion of the extremity of the upper ply to the V-plate are made to let go when the tucker-plate completes this whipping motion, and the bag blank being still held by the end and side clips to the cylinder, the entire blank is drawn forward off the tucker-plate and off the V-plate, and the tucker-plate is rotated backwardly to its original position, shown at 102 in Figs. 1 and 2 in the patent, and at P in Figs. 1, 2, and 5 in Claussen Exhibit No. 3, where it lies horizontally beneath the V-plate and is directed towards the incoming blank which passes beneath it and the V-plate.

This intelligible understanding of the device is only partially derivable from Claussen Exhibit No. 3, because that sketch, though considerably matured as compared with the first sketch, Claussen Exhibit No. 5-6, fails to show an operative construction. The patent, No. 574,020, which followed has to be resorted to in order to reach such understanding fully. The sketch, Claussen Exhibit No. 3, bears a description which is intended to be explanatory, but which does not in all respects explain. And, moreover, some features are shown in the sketch which are omitted altogether from the patent, while, on the other hand, the patent contains features not present in the sketch—all this going to show that Claussen had not, at the time of the sketch, Claussen Exhibit No. 3 (January 17, 1896) reached any satisfactory solution of the problems before him in making this V-plate machine.

One of the features shown in the sketch which did not sur-

vive in the patent, is what is called on the sketch the "carrier 6a." This so-called carrier is pivoted in a recess in the cylinder by a transverse pivot at its front end, which pivot is also the axis of the central end clip 19. On said carrier are side clips, 18 and 20, for seizing the lower tuck of the blank at the proper points to mark the ends of the triangle folds in the lower ply. The pivoted carrier is swung outward from the recess in the cylinder and up into a horizontal position beneath the blank to enable these side-clips 18 and 20 to thus grasp the lower tucks, and, having done this, it is immediately swung downward to "spread the folds," as stated on the Claussen Exhibit No. 3. This momentary elevation and immediate descent of the "carrier 6a" is proposed to be effected, in the sketch, by the single hump or prominence shown beneath the free end of the carrier in Fig. 5 of the exhibit sketch.

In the Claussen Patent, 574,020, there is no such pivoted carrier at all. The cylinder (62 Figs. 1, 5, 6, 7, and 8) is unbroken, and the end and side clips are mounted directly thereon. Apparently getting an idea from the Liddell Patent, Claussen here mounts the tucker-plate on the rising and falling arms which also carry the V-plate and the axes of the fingers which turn the corners of the upper tuck of the blank over the V-plate. And by this change Claussen gets rid of the difficulty which seems to be present and unprovided for throughout the entire sketch "Claussen No. 3." That is to say, in said sketch the tucker-plate P is shown to clash with the cylinder, not in a single figure only, but in every figure where this could occur. In Figure 6 the tucker-plate P is clashing with the surface of the cylinder in its forward swing, and in Fig. 2 it is indicated by a dotted line to clash with the cylinder in its return movement. Mr. Claussen was questioned about this, and, with his eye evidently on Fig. 6 only, he suggested that the difficulty would be remedied by making the recess in the cylinder a little longer so as to let the edge of the tucker-plate sweep into the recess. But this does not remedy the difficulty, because the tucker-plate has to sweep back, as indicated in Fig. 2. The cylinder would need, therefore, to be cut away not only "slightly" to let the tucker-plate swing forward, but a great deal, or a

second long recess would have to be made in the cylinder, to let the plate swing back. This indicates that Mr. Claussen, even up to the time of giving his testimony, had not determined how the cylinder device with the pivoted carrier, shown in his Sketch No. 3, could be made entirely operative. It looks as though, after seeing the Liddell Patent in suit, he found the whole trouble solved by mounting his tucker-plate on a pair of vibratory arms, which could be lifted any desired height and thus provide for the back and forth swings of the tucker-plate and also for the function of the so-called "carrier 6a" without any mutilation of the cylinder at all. This, then, is what he adopted and showed in his said patent, No. 574,020.

But notwithstanding such apparent borrowing from the Liddell Patent, the Claussen Patent, 574,020, does not show any operative combination claimed in the Liddell Patent, or adapted for the purposes of the Liddell Patent, in the manufacture of Deering bags. And, in like manner, the Claussen sketches, Exhibits 5-6 and 3, show, foreshadow, or even squint at no such combination. The edge of the tucker-plate is, in both the patent and the sketches, to act on the blank at a point where there is nothing behind or below it. In Fig. 6 of the Claussen Patent said tucker-plate 102 is shown to have made half its forward sweep, and it is still remote from the cylinder 62. In the sketches, as explained by Mr. Claussen, the working edge of said tucker-plate P was to strike into the recess in the cylinder between the rear end of said recess and the rear end of the carrier 6a. As actually shown in the sketch said edge of the tucker-plate strikes against the surface of the cylinder after making half its forward sweep, which it is admitted is impracticable and is claimed to be an error. In no case is it stated or pretended that the tucker-plate is to co-act with the carrier 6a as a bed, and Mr. Claussen distinctly so states in his answer to r-x-Q. 430. And, as the machine was matured in Claussen patent 574,020 which has an unbroken cylinder and no pivoted carrier, it is seen from Fig. 6 that the tucker-plate is not to co-act with the cylinder as a bed. The device as shown in the Claussen sketches, therefore, does not point to the Liddell invention, either as embodied in the Liddell Patent, where the cylinder is

unbroken, and serves as the bed, or as embodied in defendant's machine where a section of the cylinder periphery is made inwardly movable and serves as a bed. And it is notable that in none of the questions asked Mr. Claussen by defendant's counsel, when on the stand in this case, which questions appeared superficially to point to the combination claimed by Liddell, was this feature of Liddell's combination actually specified.

Said Claussen sketches failed to show another essential feature of the Liddell combination in the fact that the tucker-plate P of said sketches does not carry or co-operate with side-fingers or clips, holding the side tucks of the upper ply to the tucker-plate. The upper ply in the sketches is clipped by the side fingers 16, 16, to the non-rotative and wholly stationary V-plate. Such a construction as that of the Liddell Patent in this respect would be wholly inconsistent with the "new process" scheme, with the V-plate device and with the new bag bottom for making which this particular invention was intended. It is, therefore, apparent that defendant did not get the idea of a tucker-plate having a second and supporting axis, and carrying side tuck fingers, from this Claussen Exhibit No. 3, any more than he did the idea of a rotary bed co-operating with the tucker-plate, and that these ideas came from the Liddell Patent instead.

Said Claussen sketches failed also to show the feature of the Liddell Patent and combination consisting in an end finger on the tucker-plate to enter beneath the central point of the end of the top ply of the blank and carry it over with the tucker-plate, while forming a diamond. The machine of the sketches is not to make a diamond, but is to make only a partial diamond, or bob-tail diamond, called in the Claussen Patent, 574020, a "truncated diamond." There is no rear flap to this truncated diamond, such as is made from the top ply of the blank in forming the regular diamond of the Deering bag. The end of the upper ply is not to be lifted at all. On the other hand it is held down under the points of the V-plate, and it stays there, while the peculiar formation called a "truncated diamond" is being made. Hence defendant did not get

from the Claussen sketches, Nos. 5-6 and 3, the idea of a tucker or former-plate having a supporting axis remote from its creasing edge and carrying side fingers and an end finger, in combination with a rotary bed, but obtained it from the Liddell Patent, which was the only place where such a combination could be found at the date when the application for said Liddell patent was filed, or at the date of its issue.

It is thus evident, in the light of the Claussen Patent, 574020, that the V-plate machine, after which Claussen was struggling in his first sketch of November 6, 1895, "Claussen Exhibit Nos. 5-6," and in Claussen Exhibit No. 3, has no correspondence with the Liddell invention as disclosed in the patent sued upon, or as formally modified in defendant's machine. The machine of said sketches presents the single feature of a tucker-plate supported on an axis remote from its creasing edge, but said creasing edge is not itself strictly an axis with respect to any rocking movement on said edge upon any bed or other part of the machine. It merely sweeps through space, though in contact with an unsupported blank. The tucker-plate is not combined with a rotary bed, and it is not equipped with either side fingers alone or with side fingers and an end finger, for carrying over the top ply of a blank. The machine is even not for carrying over the top ply at all, and is not for making a diamond, in which the top ply is to be carried over. It is for making a different sort of bag altogether from that of the Liddell Patent and of defendant's machine, and it presents a combination of mechanisms incapable of use in making a Deering bag, which the Liddell machine and defendant's machine alike are contrived to make.

Defendant's Drawing No. 9.

These facts being now obvious, it is equally evident, I think, that "Defendant's Drawing No. 9," showing, in column 1, the matter shown in Claussen Exhibit No. 3 (under the heading "Claussen, January 17, 1896"); in column 2 some of the diamond-forming devices of the Claussen Patent, 598497, and in column 3 devices of defendant's machine, is necessarily fallacious and inconsequent, and that the testimony of Mr. Stone concerning said "Defendant's Drawing No. 9" is unfounded

in fact. Moreover, it will be observed, that while the figures of column 1 in this drawing depart from the sketch, Claussen Exhibit No. 3, so far as to provide room in the recess in the cylinder for the entrance and passage of the tucker-plate P in making the fold in the blank, they do not show an operative construction, because they do not show how the tucker-plate may ever be returned to its original position after its forward movement. This fact seems to me especially significant because Mr. Claussen also did not provide for this return movement of the tucker-plate either in his said sketch No. 3, or in his testimony correcting it. It seems, therefore, that both Mr. Claussen, the experienced inventor and bag machine builder, Mr. Walker, under whose direction this drawing was prepared, and who knows all about bag machinery since the beginning of the art, and Mr. Stone, the astute, long-experienced and highly-educated "machinist, draughtsman and designer of machinery," all overlooked this vital defect in said sketch. If it were so "obvious" as is contended, it would seem to me that the keen eye of some one of these three skilled individuals should have detected it before it was called to the attention of Mr. Stone, and admitted by him, in question and answer x-Q. 242.

[*Adjourned to Saturday, November 21, 1903, at 10:30 A. M.*]

Saturday, November 21, 1903.

[*Met pursuant to adjournment.*]

Present—The Notary and counsel as before.

[*Mr. Dayton resumes his answer to Q. 259.*]

When Defendant's Drawing No. 9 was submitted to Mr. Stone in Q. 28, D. P. R., he stated that the figures in the first column of said drawing "correspond in every particular to the Claussen Exhibit No. 3, with two exceptions." The first exception is that the said figures of column 1 "show more stages in the operation of opening out a tucked paper tube and folding it down into a paper bag blank (he does not say a diamond) than do the figures of the Claussen Exhibit No. 3." The second exception which he states is, that said figures of the first col-

umn "show the outline of the cylinder, whereas in most of the figures of the Clausen Exhibit No. 3, only a portion of the outline of the cylinder is shown." Not having prepared the drawing himself, as he states on his cross-examination in answer to x-Q. 241, where he says that it was submitted to him by the defendant's counsel, his observation of only these two simple variations from the Clausen sketch might be excusable in an ordinary observer, "but hardly, I should say, in a critical analyst of mechanisms, a designer of machinery, and an expert on the stand." On a re-reading of question and answer x-Q. 244, I find that while he there recognized a change from Clausen Exhibit No. 3 in the figures of Defendant's Drawing No. 9, to the extent of providing for the forward movement of the tucker-plate, he did not even then recognize the necessity for further change in order to permit the return of the tucker-plate. But he does admit that the change actually made from the sketch was one necessary to operativeness. Now it is claimed that the figures of column 1 of Defendant's Drawing No. 9 still represent an inoperative construction, because there is no provision in said figures for the return of the tucker-plate.

In the further answer of Mr. Stone to Q. 28, and in the second paragraph on page 22, R. P. R., Mr. Stone says of the figures in column 1 of Defendant's Drawing No. 9 that: "The clip 16, 16, operated by means not shown in Defendant's Drawing No. 9, but fully set forth in the Clausen Exhibit No. 3, are provided to fold the forward corners of the upper ply of the bag tube over the triangular projection 11 and 12 (of the V-plate)." He is in error in this statement; the means for operating said fingers not being "fully set forth in the Clausen Exhibit No. 3." Various other errors as to the contemplated operation of the machine foreshadowed in Clausen Exhibit No. 3, occur in said answer, which he doubtless would have avoided had his attention been called to the Clausen Patent, No. 574,020, taken out for the V-plate machine of said Clausen Exhibit No. 3.

As to the figures in the middle column of Defendant's Drawing No. 9, arranged under the heading "Clausen 500,

$\frac{4\pi r^2}{2}$." Mr. Stone says, at the bottom of page 111, that if the "conveyor 30 is to be called a cylinder, it should be accompanied by an explanation that that part of the periphery corresponding to a cylinder, is less than half its total periphery." In this connection I point out that Mr. Clemens himself, in the conviction upon Clemens Exhibit No. 3, calls the peripherally recessed member 6 a "cylinder," several times, and wherever it is referred to, first, in the fourth line; second, in the sixth line; third, in the eighth line; fourth, in the fourteenth line; fifth, in the seventh line from the bottom; and sixth, in the last line. There ought, therefore, in my judgment, to be no hesitation manifested in calling the oppositely recessed member 21 of the figure in the second column of Defendant's Drawing No. 8 a cylinder.

Having described the operation of the machine as far as shown in the middle column of Defendant's Drawing No. 8, Mr. Stone makes comparison of the figure of column 1 with the figure of column 2 of said drawing, beginning with the middle paragraph on page 115, lin. 9. In this paragraph he says that:

> "It will be seen, first, that the oscillation of the carrier "in the Clemens Drawing of January 17, 1896, is in "respect to its cylinder, and the oscillation of the carrier "in the Clemens patent, in respect to its conveyor or "cylinder are identical, except that in the Clemens Draw- "ing of January 17, 1896, the carrier oscillates from with- "out the periphery of the cylinder inwardly in substantial "coincidence with said periphery and back again, while "in the Clemens Patent 580,487, the carrier is oscillated "from a position in substantial coincidence with the peri- "phery of its conveyor, inwardly toward the center of "rotation of said conveyor, and back again."

In the next paragraph Mr. Stone points out that in the written matter upon Clemens Exhibit No. 3 it is stated that "the carrier is could, if found necessary, drop much farther down to connect the balls, when they are down to C, C, and then raise again to the level of the cylinder."

These statements of Mr. Stone, considered as describing a

part of the basis of the ultimate conclusion reached by him and expressed at the very top of page 227, to the effect that,

> "the leading fundamental ideas of the oscillating carrier, "its appurtenances, actuating mechanism, and *the mode* "*of operation* of the Claussen Patent, No. "598,497, are "*all* to be found, and in substantially identically embodi- "ment, in the Claussen Drawing of January 17, 1896." (Italics mine.)

require a moment's attention. The carrier 6a of Claussen Exhibit No. 3 does not co-operate, as a bed, with the tucker-plate, as in the Claussen Patent, 398,497. The carrier 6a of the sketch, therefore, does not swing inward to give passage for the tucker-plate, as in the said Claussen Patent. The carrier 6a of the sketch is to carry the side clips up into the elevated horizontal plane of the blank to catch the lower ply, and in the patent the pivoted bed or carrier 56 does not swing outside the periphery of the cylinder at all for any purpose. The carrier 6a of the sketch having, when elevated, caught the lower tuck of the blank, swings down "to spread the folds," and it swings a long way for this purpose—and it may swing further than it is shown in the sketch as swinging, if necessary; the carrier of the Claussen Patent, 598,497, does not swing inward to spread the folds, but to let the tucker-plate swing over it on the blank which it supports as a bed. The carrier 6a of the sketch is normally at its inner position continuous with the stationary portions of the periphery, and moves out to lift the side clips into position to catch the elevated blank only momentarily; in the Claussen Patent the carrier, or pivoted section, of the cylinder periphery moves inward from the stationary periphery in a manner regulated to the inward sweep of the edge of the tucker-plate. There is, therefore, no correspondence whatever in "mode of operation" between the Claussen Sketch, Exhibit No. 3, and the Claussen Patent, No. 598,497, as to the oscillating carrier, and Mr. Stone's above-quoted conclusion is fundamentally wrong.

Mr. Stone, in his "*Second*" citation of difference between the sketch and the patent, refers to the cams controlling the

movements of the pivoted carriers, and says that this "is a difference of timing only, cam 8 giving to its corresponding carrier a long inward dwell, and cam 59 giving to its carrier a long outward dwell." There is this difference in the cams, but it is not the immaterial difference Mr. Stone implies. It is an essential difference, belonging to an essentially different mode of operation and the essentially different purpose of the carrier, in the two machines, as just above pointed out. And it is immaterial, in my judgment, that, as Mr. Stone asserts in his "*Third*" branch of the comparison, the carrier is in both cases provided with similar clips.

The paragraph of Mr. Stone's comparison, beginning at the middle of page 227, refers to the V-plate 10, and its projections 11 and 12, and the side clips 16, 16, of Claussen Exhibit No. 3, as things which are left out of the Claussen Patent as "parts not necessary or useful in making the so-called Deering bag for which the machine of the Claussen Patent, No. 598497, was designed." But these parts *are* necessary for the machine foreshadowed in Claussen Exhibit No. 3, and they are retained in the patent for that machine, No. 574020. The machines of the two patents are, as Mr. Claussen states, two different inventions for performing two distinctly different processes or operations, and for producing two distinctly different products. Claussen says that the machine of Claussen Exhibits 5 and 3 cannot make a Deering bag. The two machines operate on totally different principles, contain totally different combinations, having totally different modes of operation, for the production of their totally different results, and, therefore, Mr. Stone's contention that the devices of the Claussen Patent, No. 598497, flow out of the sketches, Claussen Exhibits 5 and 3, is in my opinion, wholly erroneous and unwarranted.

[*Recess.*]

Claussen Exhibit No. 4.

Defendant's Exhibit, Claussen Exhibit No. 4, the same being a yellow paper bag made at the request of Mr. Walker to represent the new process bag proposed to be made on a

V-plate machine, foreshadowed in Claussen Exhibit No. 3, and ultimately devised in the form shown and described in the Claussen Patent, 574020, will, on close examination, be seen to differ very materially from the Deering bag. The overturned corners are in this exhibit pasted down to the subjacent portions of the top ply of the original blank, and the two raw or serrated edges of each of said corners are pasted together so as to make a neat, close-bottomed bag. But such pasting of the plies of each corner to each other and of each double-ply corner to the subjacent paper were, in this instance, done by hand, and I wish to point out that neither in the machine, so far as indicated in Claussen Exhibit No. 3, nor in the machine shown and described in the Claussen Patent No. 574020, is there any means present or practicable for applying the paste to the plies of the corners or between the corners and the subjacent paper. I have folded another bag blank into the same "new process form" and fastened the single end flap down into place by a pin to represent the extent to which the V-plate machine applies the paste. The overturned corners, it will be seen, are left entirely loose, and the bag would on this account, and for the additional reason that the bottom is not entirely closed, be an impracticable bag.

Claussen Exhibit No. 1-2.

Having, as I believe, shown that Claussen Patent, 598497, which is for a machine for making the diamond of a Deering bag bottom, is not derived from the Claussen sketches, No. 5-6 and 3, I take up the remaining Claussen Exhibit No. 2, which is a tracing made from the Claussen original sketch, Claussen Exhibit No. 1, the date of which is given as November 22, 1895, in Claussen's testimony.

Said Claussen Exhibit No. 2 differs materially from the other Claussen Exhibit sketches in appearing, when supplemented by Mr. Claussen's explanation concerning parts not shown in the sketch, to have a legitimate connection with the invention which subsequently appears for the first time in the Claussen Patent, No. 598497, dated February 8, 1898, but for which application was filed July 29, 1896. Said Claussen Exhibit No. 2, however, does not in itself afford any full or ade-

quate disclosure, in my judgment, of the subject matter of said patent, 598497. As Mr. Claussen explains the parts of the sketch, D is a shaft, A is a revolving tucker-plate somehow supported on said shaft and oscillating thereon or therewith. A bag blank is shown at H I, and in Fig. 2 of the sketch the upper surface of the bag blank, coincident with the line *aa*, appears to run through the shaft. There is nothing said, even in the testimony, about the shaft being separated in the middle, or made as two shafts instead of one, but it is spoken of by Mr. Claussen in his answer to Q. 106, and also in counsel's question 105, in the singular number, as though it were a continuous shaft. And I see nothing in the sketch to indicate the contrary, except the impossibility of passing the bag blank through the shaft. The sketch also shows in Figs. 2 and 3 an apparently stationary bar J over which the bag blank passes towards the shaft D from the left, and beneath the transverse portion of the tucker-plate A. B and C appear to be beveled, rotary side-clips for engaging the upper tucks of the blank. E is explained to be one of two side-clips for pressing down the lower tucks against something. Figs. 3 and 4 indicate that the tucker A is to have a semi-circular rotary sweep of about 180 degrees from its position shown in Figs. 1 and 2, and then back, the clips B and C also rotating and keeping in the same plane. There is no indication in the drawing of any bed, or of anything else with which the creasing edge of the tucker is to co-operate. Concerning this matter and the rest of the sketch, as described by Mr. Claussen in his answer to Q. 88 (where he was asked "What did you represent in the four figures of the drawing on the upper two-thirds of the sheet?") Mr. Claussen says:

> "A. I represented a paper bag blank, and an oscillat-
> "ing plate which folded that blank at a transverse line
> "across the blank, and two pairs of clips; the lower clips
> "were intended to be carried on a folding bed, and the
> "upper clips were supposed to revolve on the centre of that
> "oscillating plate. I am examining the drawing while I
> "am answering this question."

In answer to Q. 108, he says the tracing does not show any

folding bed. In answer to Q. 13 he says that he thinks that to a machanical engineer previously skilled in paper bag machinery, that intention would be apparent. Questions 14, 15 and 16, with their answers, read as follows:

"Q. 114. What kind of a folding bed did you intend "to use when you made Claussen Exhibit No. 1 and which "you intended to carry the lower claps E? A. I don't "remember what kind of a folding bed I had in mind, when "I was making the sketch; it might have been a recipro-"cating one, or it might have been a rotating one."

"Q. 115. What intention did you have, if any, at that "time, about any upward and downward movement of "the folding bed; whether it reciprocated forward and "back on the one hand; or whether, on the other hand, it "rotated around a central shaft?

"A. I don't remember what kind I intended at the time "I made the sketch.

"Q. 116. What thought did you have at the time you "made Claussen Exhibit No. 1, upon the question whether "the tucker-plate of that sketch could work with a fold-"ing bed, the surface of which would always occupy the "same horizontal elevation, during the time the edge of "the tucker-plate was passing through this semi-circular "path F?

"A. I don't really remember what kind of bed I should "have used at the time; *for if I had had any idea I should "have indicated it on the sketch.*" (Italics mine.)

It is very clear from this testimony of Mr. Claussen, I think, that the sketch Claussen Exhibit No. 1, and its duplicate, Claussen Exhibit No. 2, does not imply a rotary bed, though that is what the inventor determined upon in the principal form of the machine shown in the Claussen Patent, No. 598,497. It is also clear, I think, that the sketch does not imply any bed at all, in the sense of a supporting surface for the blank against or proximate to which the creasing edge of the folding-plate may act upon the blank, and at the same speed with which said creasing edge shall move. If the previously made sketch,

Claussen Exhibit No. 5-6, implies anything in connection with Claussen Exhibit No. 2, its implication is that there was nothing of this sort, for in said Claussen Exhibit No. 5-6 the edge of the similar tucker P does not have this relation to the pivoted carrier 6a, and it cannot have this relation with the surface of the cylinder, because it clashes with the latter, and the elaboration of the Claussen Exhibit No. 5-6, presented in Claussen Exhibit No. 3, as modified and explained in the testimony of Mr. Claussen, indicates that the edge of the tucker-plate enters an open space in the cylinder and is opposed by nothing.

It appears, therefore, that while, so far as it goes, Claussen Exhibit No. 2 is partially in keeping with the Claussen Patent, No. 598,497, said Exhibit Sketch is so incomplete as to fall far short of disclosing the construction and operation set forth in said Claussen Patent.

It is also clear, in my judgment, that said sketch, Claussen Exhibit No. 1-2 wholly fails to show an operative mechanism of any sort for any purpose. It lacks essential parts for co-operation with the parts shown; it lacks actuating means for even the parts that are shown; and it lacks any suggestion of means for co-ordinating the illustrated parts with essential parts which are omitted. It is perfectly certain, I think, that said sketch, Claussen Exhibit No. 1, does not show or foreshadow the co-operative arrangement of the tucker-plate A with the cylinder bed 56 of the Claussen Patent, No. 598,497, as shown in said patent and also shown in the middle column of Defendant's Drawing No. 9.

It follows, therefore, that Liddell, in the patent here in suit, is shown to be the first in the entire art of paper bag making to conceive and show a tucker or folding-plate having side tuck-clips moving therewith, and having two axes of motion, one, at its edge over a bed supporting the blank, and the other remote from said working edge and relatively movable towards and from the bed in the movement of the creasing edge with the bed and blank, in the formation of a diamond on a tucked tubular blank.

[Defendant's counsel objects to the foregoing answer of about eight thousand words to Q. 259, on the same grounds as

those upon which the objection to that question were based; and also because the answer treats of a number of subjects not within the scope of the question; and also because the answer is a partisan argument based upon such facts and such fictions as may give some color to that argument, while carefully omitting other facts already proved in the record, which, if attended to, would show the argument to be invalid in some of its parts and in its general conclusion.]

[*Adjourned to Monday, November 23, 1903, at 2 P. M.*]

Monday, November 23, 1903.

[*Met pursuant to adjournment.*]

Present—The Notary, and Counsel as before.

[*Complainant's counsel offers in evidence a printed Patent Office copy of U. S. Letters Patent to Edward E. Claussen, of Hartford, Conn., for paper bag machine, No. 574,020, dated December 29th, 1896, and the same is marked "Complainant's Exhibit Claussen Patent, No. 574,020, A. B. C., Notary Public, Nov. 23, 1903."*

[*Defendant's counsel objects to the Claussen Patent 574,020, as immaterial to all the issues in the suit.*]

[*Complainant's counsel offers in evidence the paper bag produced by the witness in connection with his last answer, and the same is marked "Complainant's Exhibit Paper Bag of Claussen Patent, No. 574,020, A. B. C., Notary Public, Nov. 23, 1903."*

[*Objected to as immaterial.*]

Q. 260. Please state whether you have read and understand the testimony already given on complainant's rebuttal herein by Rudolph M. Hunter, beginning July 23, 1903; also state whether you have examined and understand Complainant's Exhibit Hunter File of Case A', and complainant's Exhibit Hunter File of Case B, introduced in connection therewith. Also state in this connection whether you have read and understand the testimony on the part of defendant of

William Liddell and of Charles D. King (recalled on April 3, 1903, and of Wilbur M. Stone (recalled on May 4, 1903), and the exhibits introduced in connection with said testimony?

A. I have examined the files, exhibits and testimony referred to in the question, and believe I understand them.

Q. 261. Please consider more especially the testimony and exhibits covered by the last question and answer, and state how, in your opinion, what is shown in Fig. 1 of the drawings of the patent in suit as issued, and what is shown in Fig. 1 as originally prepared of the drawings of Complainant's Exhibit Hunter File of Case A, and what is shown in Defendant's Exhibit Liddell Drawing No. 1, compare in respect to invention. In your answer please call attention to any changes in specification and claims of the application for Liddell Patent in suit while in the office of Mr. R. M. Hunter, prior to filing, and as bearing on the matter above inquired about. Also give your opinion as to the operativeness of the Liddell device, as shown in Liddell Drawing No. 1, and any reasons for such opinion?

[*Defendant's counsel objects to this question on the following grounds:*]

[*First. It requires the witness to compare three drawings "in respect to invention," whereas it ought to require him to compare those drawings in respect of construction and mode of operation; those being questions of fact, whereas the question of invention is a question of law.*]

[*Second. The question requires the witness to give secondary evidence of the comparative character of documents, which comparative character can be proved only by the documents themselves.*]

[*Third. The question requires the witness to give "any reasons" for whatever opinion he entertains as to the operativeness of the Liddell device as shown in Liddell Drawing No. 1; whereas the question ought to require the witness to give the true reasons, and all of the true reasons, which negative or affirm that operativeness, as the case may be.*]

[*Fourth. The question apparently calls for another parti-*

san argument of many thousands of words upon the numerous subjects which the question suggests; instead of calling upon the witness, as it should, to state the fact upon some definite question of fact, or point of fact, material to the case.]

A. This question seems to me to be divisible into three branches, to wit: First, an inquiry as to how, in my opinion, the drawing, Fig. 1, of the Liddell Patent in suit, the originally prepared drawing of Fig. 1, first made for the application for said Liddell Patent and subsequently changed to make the drawing Fig. 1 of the patent, and Defendant's Exhibit Liddell Drawing No. 1, compare with each other as to those essential features of construction and operation which characterize the Liddell invention; second, what, if any, changes were made in the specification and claims drawn incompletely by Mr. Hunter, Mr. Liddell's attorney, with the originally prepared drawing of Fig. 1 before him, when said drawing was changed to the form shown in Fig. 1 of the Liddell Patent; third, as to my opinion with respect to the operativeness of the Liddell device as shown in Defendant's Exhibit Liddell Drawing No. 1, with my reasons for the opinion given.

Answering these separate inquiries in their order, I first make

Comparison of Fig. 1 of Patent in Suit with Fig. 1 as Originally Prepared, and with Defendant's Exhibit Liddell Drawing No. 1.

The originally prepared drawing, Fig. 1, is represented here only by a blue print, and, as I understand it, has no other form of present existence. It corresponds in all respects with Fig. 1 of the Liddell Patent in suit except as to the actuating mechanism for operating the forming-plate E through the arms F and the gears upon one of said arms. And I learn from the testimony that the original drawing was itself changed by erasure of the eccentric gears K on the shafts L and *f*, as seen in the original blue-print, and the introduction in place of them, of the cams K K′ the arm F′ projecting from the shaft *f*, the slide *k* and its guide and connecting link k^2, shown in Fig. 1

of the Liddell Patent for rocking the gear M′. The original drawing was defective mainly because it lacked a cam for raising the arms F. It showed a spring marked F′ for pulling downward upon said arms, as if to hold the arms to the path of some cam, but the cam itself is not shown, and there is also not shown any arm leading from the shaft *f* to where the cam for lifting the arms F would naturally be placed, to wit: on the drive shaft L. This omitted cam mechanism is what the testimony shows the attorney's draughtsman to have misunderstood, or failed fully to grasp.

In Defendant's Exhibit Liddell Drawing No. 1 are shown generally, the same instrumentalities for actuating the forming-plate E that are shown in the blue-print of the original drawing of Fig. 1, found in the Hunter File, but with the addition of a cam, marked K′ on the driving shaft L, and an arm F′ connected with the shaft *f* for raising the pair of arms F. From said Liddell Drawing No. 1 is omitted the coiled spring for drawing the arms downward. The eccentric gears of the blue-print (designated by the letter K on one of them) are generally shown on the Liddell Drawing No. 1 as K 1 K². In the said Liddell Drawing said gears are not mounted so eccentrically on their shafts L and *f* as in the blue-print, but this is immaterial and does not affect the general correspondence.

In Fig. 1 of the Liddell Patent Drawing, as before pointed out, the two eccentric, intermeshing gear wheels of the other two drawings are omitted, and, besides the cam K′, which is shown in the Liddell Drawing No. 1, the patent has an additional cam K for controlling the movements of the uppermost loose gear M′, of the train leading to the forming-plate, which gear M′ is common to all the drawings.

Neither one of the three drawings, to wit: the blue-print of the original drawing, the drawing in the patent, and the Liddell Drawing No. 1, makes any pretence of being an accurate "working drawing" from which a properly working machine could be built, and the blue-print does not pretend to show the cam elements originally intended by Mr. Liddell, as shown in the Liddell Drawing No. 1, but admittedly not understood and omitted by the draughtsman when he made the drawing from

which the blue-print was taken. Supplying the cam and its co-acting arm in the blue-print, according to the plan indicated in Liddell Drawing No. 1, and there would be present in each of the three drawings being compared all the essential elements requisite to completeness for the execution of Liddell's purpose. The various parts would need to be given their proper proportions and, as to the cams, their proper contours and forms, by some competent engineer or mechanic acquainted with the art of making paper bag machinery, but, the parts would all be there and ready for such proportioning and timing at the hands of the competent builder. The difference between the construction of the Liddell Drawing No. 1 and of the blue-print, on the one hand, and that of the Liddell Patent Drawings, on the other hand, would be solely in the manner of getting the forming-plate back to its original position after going through its proper motions with respect to the cylinder in forming a diamond. In respect of this last or working operation of the forming-plate there is no difference whatever. But in going back to its starting place, said forming-plate which in the precise construction shown in the patent drawing, swings back *below* its supporting axis *c* will, in the similar constructions of the Liddell Drawing No. 1 and of the blue-print, swing back *above* the axis *c*. In other words, in the patent drawings the forming-plate E *vibrates*, and in the other two drawings it *revolves*, on its axis *c*. In still other words, in all these drawings the forming-plate, which is pivoted upon an axis remote from its working edge, revolves in the same direction, in the same way, and in the same relation to the bed and blank, while doing its work, and then revolves back to its starting place on the same axis *c*, but in different circular directions. The difference is like that of a man who has occasion to go to the bank and to the barber's both on the same block. He goes from his office to both these places, and may come back to his office either by retracing his steps, or by going around the block. The results are precisely the same in both cases.

In drawing the specification for the Liddell Patent, this immateriality as to the path of return to its original starting place by the forming-plate was expressly recognized, as will be seen

by the words found on page 2, lines 10 to 13, which read as follows: "The return movement of the plate is unimportant, "so long as it is secured in time to receive a new bag-tube or sec- "tion thereof." And this statement would have been just as true and obvious if the original drawing had been allowed to stand as first prepared, with the addition of the missing and misunderstood cam mechanism, as it is now in the Liddell Patent where it is accompanied by the actual drawing of Fig. 1. In either case it seems to include the other. And inasmuch as the key to the possibility of both the continuous revolution and the partial back and forth revolution of the forming-plate, in its combination with the rotary bed, is due to the basic feature of a supporting axis for the plate remote from its working edge, it seems to me evident that both are properly included in the same invention, as the last above quoted statement from the patent indicates they were intended to be. I, therefore, regard the two different constructions shown in the blue-print and the Liddell Drawing No. 1, on the one hand, and in the Drawings of the Liddell Patent in suit, on the other hand, as essentially the same construction and the same invention. Perhaps it will be more accurate to say that they are merely modified construc- tions of the same invention.

In this connection it is to be remembered that Liddell took to his attorney, Mr. Hunter, at the same time two embodiments of his fundamental idea of a double axised forming-plate for making the diamond on bellows folded tubes, one where such a forming-plate is combined with a rotarially reciprocating bed, as shown in the Liddell Patent, 564,288, the application for which was called "Case B," and the other where such a form- ing-plate is combined with a continuously advancing or rotat- ing bed, as shown in the Liddell Patent in suit, application for which was called "Case A" (and is so recognized in the other Liddell Patent), and also shown in Defendant's Exhibit Liddel. Drawing No. 1. It was naturally recognizable by Mr. Liddell and by his attorney, under these circumstances, that, although Liddell may have proposed that in Case A, the forming-plate might revolve entirely around its axis, it need not necessarily so revolve, but might reciprocate or vibrate on its supporting

axis, in connection with the rotating bed as in connection with the reciprocating bed. And, as a matter of fact, this is a distinct peculiarity of a double axised folding-plate, that it may be combined either with a continuously rotating or with a reciprocating bed, being, in this respect, wholly unlike the forming-plate when having a single axis coincident with its cutting edge (as a single axis must be) which is capable only of combination with a reciprocating bed. The practicability of the single axised plate with a reciprocating bed is shown in the Loewe & Honiss Patent, No. 237,966, and its impracticability with a rotary bed is equally shown by Defendant's Exhibit, Libbell Drawing No. 1.

[*Adjourned to Tuesday, November 24, 1903, at 10:30 A. M.*]

Tuesday, November 24, 1903.

[*Met pursuant to adjournment.*]

Present—The Notary and counsel as before.

[*Mr. Dayton continues his answer to Q. 361.*]

Changes Made in the Specification.

The testimony of Mr. Hunter, patent soliciting attorney for Mr. Libbell, shows that the recognized omissions from the originally prepared Fig. 1 of the drawing were expected to call for some insertions and corrections in the originally prepared description, and such changes were made. It appears that when Libbell and Hunter got together for the final revision of the application, on January 7, 1896, the slight change in the drawing necessary to give the rotary reciprocatory movement to the forming-plate, instead of a continuous revolution of said plate, was also agreed upon, and the detailed description was made to conform with this change in the drawing. Hence the changed drawing appears in Fig. 1 of the Libbell patent, as issued, which patent also contains the final changes in the specification. No changes whatever, growing out of such change in Fig. 1 of the drawings, were made in the claims, the claims as originally drawn being equally applicable, both in terms and in spirit, to both forms of Fig. 1. This fact alone shows the identity of the broad invention first shown by Lib-

[illegible] as drawn and imperfectly indicated in the originally prepared Fig. 1, and finally shown in Fig. 1 of the patent after the conference between Liddell and Hunter on January 13th, 1920.

These changes in the description called for and resulting from a complete showing of all parts necessary to a successful cycle of movements on the part of the forming plate, as found in Fig. 1 of the patent, consist of the following matters, to wit:

First, on page 3 of the original draft of the specification when, opposite the last two paragraphs, Mr. Hunter placed penciled question marks, the words "plate E" were supplanted by the words "ram E" and also "E''." This correction covered the provision of means by which the arms F are "moved away from the cylinder about the axis f." The last sentence on the page, obviously incomplete (as noted by the marginal question marks), was corrected and amplified to correspond with the facts learned and determined upon at that time, so as to read as we now find it, expanded and divided into sentences, at lines 83 of page 3, to line 33, page 4, of the Liddell Patent Specifications.

Second, on page 4 of the original draft, as found in the Liddell File, Case A, the middle paragraph opposite which was also placed a penciled question mark, was revised to correspond, as a description of operation, with the preceding description of construction, and this revised paragraph is found in the printed patent specifications at page 4, lines 100 to 127. In this revised statement, just mentioned, it will be observed that the words "rotation or oscillation of the plate E" are employed, with the evident view of retaining the means of the forming plate to its starting point by continued rotation as well as by reciprocation or oscillation.

Other changes were made in the specifications, such as, I have found from my experience as a patent solicitor, often result from a final conference with an inventor over originally prepared specifications and drawings. That is to say, I find that four small additional figures were placed upon Sheet 1, along with the finished Fig. 1, for the purpose of showing how the tubular blanks might be drawn through the diameter

forming mechanism without the aid of the central cylinder-clip *c*, namely, by leaving the tubes connected with each other so as to be drawn along over and with the surface of the cylinder by drag-rolls acting beyond the diamond-forming mechanism. The specification was, of course, amended to include the general description of the added figures of the drawing, as written out in manuscript in red ink in the Exhibit File, and as appears in the printed patent at lines 58 to 66, page 1. The operation of the blank-carrying mechanism was also written out in red ink, as appears from the Exhibit Hunter File on the yellow sheet of paper therein, and this matter appears in the printed patent, beginning with line 128, on page 2, and ending at line 13, on page 3. I find this added matter again referred to on page 2 of the original draft, at the short red line interlineation on said page. As bearing also on the same added matter of Figs. 9 to 12, those originally drawn claims which, in terms, called for "one or more nippers" *c*, were amended by the erasure of these words and, in several of them, the broader terms "means to move the tag tube with the cylinder" were added. A few merely verbal typographical corrections were also made which have no significance whatever as to the present inquiry.

I may properly add, I think that, speaking from my experience of more than thirty years in the preparation of p. t specifications and claims, and in conferring with inven. rs about their inventions described in such specifications and claims, in the course of preparing their cases for the Patent Office, the record presented by Complainant's Exhibit Hunter File, Case A, discloses nothing remarkable or exceptional in the work of a patent solicitor. It is even not uncommon for the draughtsman, in preparing drawings from rude or hasty sketches, to fail, at first, to perfectly understand and to perfectly delineate an inventor's idea, and this is especially true when the inventor sketches in his presence different ideas as modifications of each other. In this particular case some confusion was natural by reason of the fact that two forms of machine, for utilizing the basic idea of a double axised forming-plate, were presented by Mr. Liddell to the draughtsman, one form being that which was made the subject of Case B and of the Liddell Patent, 564288, and the other that which was made

the subject of Case A and of the Liddell Patent, 568969, here in suit. And besides, according to Mr. Liddell's own testimony, the sketches for the rotary bed construction, shown in Case A and the patent in suit, was not perfectly elaborated when he first went to Mr. Hunter with it. Nor is it at all surprising to me, in view of my experience, that Mr. Liddell should at this late date have only vague recollection of his interviews with Mr. Hunter while the cases were, prepared—a condition greatly favored, doubtless, by the fact that he has since that time had no ownership of the invention calculated to keep the invention and its history alive in his mind. I find that I have been myself equally forgetful concerning some of my own inventions and patents which I have tried to recall during my examination of this matter for the purpose of putting myself in Mr. Liddell's place.

[*Recess.*]

As to Operativeness of Liddell Device of Defendant's Exhibit, Liddell Drawing No. 1.

Mr. Liddell, while testifying as a witness for defendant, expressed his opinion that this device of Liddell Drawing No. 1 is operative to give the required movements to the forming-plate in forming the diamond and returning the forming-plate to its starting place. He did not pretend that he had shown precisely the necessary conteurs of the eccentric gears K and K^2, and of the cam K', in the pasteboard model from which Liddell Drawing No. 1 was made, but as he puts it at the conclusion of his answer to x-Q. 235, it was his opinion that:

> "The eccentric gears or obliptic gears (which is the "same thing) would have to be modeled and shaped, "probably a great many times, before it would be pos-"sible to get the desired effect that is wanted."

In his previous answer to direct question 56 he stated that:

> "A. To make the forming-plate rotate, to the nearest "of my recollection, I introduced two gears, which I call "obliptic gears; which I designed and expected to have "them constructed in *a certain shape*, so that the forming-

"plate, or the forward end of the forming-plate that "comes in contact with the cylinder, would travel at the "same speed as the cylinder, during the formation of the "bottom of the bag."

When asked in the next question what his idea was in employing two "obliptic" gears instead of two circular gears, he replied:

"A. For the reason that two circular gears would not "make the forming-plate travel exactly at the same speed "as the cylinder. It was necessary to have obliptic gears "of *a certain shape*, to make the forming-plate travel at "exactly the same speed as the cylinder."

In his answer to Q. 65 Mr. Liddell said:

" * * * The forming-plate was caused to revolve "by means of three gears and two obliptic gears *made of* "*the proper shape;* the oscillation of the arms was caused "by a cam * * * "

Later, in answer to Q. 86, asking him to look at the model: "Defendant's Exhibit, Model of Liddell Drawing No. 1," Mr. Liddell says:

" * * * Well, this is the first time I have seen "this model, and as far as it goes I should say it repre- "sents the Liddell Drawing No. 1. Of course I can't "positively state whether the *cam* and obliptic *gears* are "*made perfectly accurate*, without having the cylinder "and the other parts to work in conjunction to the same."

In answer to cross question 340 Mr. Liddell again intimates his belief in the operativeness of the construction shown in Liddell Drawing No. 1, and this seems to have been his conviction throughout his entire deposition. I conclude direct reference to the deposition of Mr. Liddell by quoting question and answer x-Q. 370, as follows:

"x-Q. 370. Referring to the Liddell Drawing No. 1, "you would not assert, would you, that the mechanical "method therein shown for revolving the former-plate,

"above the revolving cylinder, and in connection there-
"with, was the only mechanical method for effecting such
"revolution of the former-plate

"A. I know of no means at present that would perform
"that function *so simply and perfectly*, as the means
"shown in Liddell Drawing No. 1; although I do not as-
"sert that that is the only means of accomplishing the
"same result; although I doubt very much, that it ever
"could be accomplished in a manner to operate perfectly
"by any other mechanism."

I here produce a model which fully justifies Mr. Liddell's confidence in the operativeness of the construction generally shown in Defendant's Exhibit Liddell Drawing No. 1.

Complainant's Model, Defendant's Drawing No. 1.

This model shows conclusively that said construction of Defendant's Drawing No. 1 is perfectly operative. And, as I understand the fact, said model has not required the numerous trials thought necessary by Mr. Liddell to get the elliptic gears or eccentric gears of the proper shape. I am told that they were made of their present and successful shape on the first trial. Nor has there been any material difficulty in determining the contour of the cam for controlling the up and down movements of the arms carrying the gears. This cam, as shown in the model, is a celluloid plate and easily whittled or cut to the desired form. As I am informed, this is the second cam made, the first one having been cut away too much at some point, making another necessary.

The model speaks for itself. The pointer fastened to the terminal gear wheel N on the free end of the vibratory arm F of said model follows the circumference of the cylinder perfectly, to all intents and purposes, and, in my judgment, with sufficient accuracy for a practical and successful machine for the actual manufacture of paper bags. But even such very slight and almost imperceptible deviation from absolute accuracy in the movement of the end of the pointer with respect to the cylinder as may be detected in the model, can obviously

be perfectly corrected by a little more care in the shaping of the cam.

It is, therefore, my opinion, in answer to the last branch of the question, that the Liddell device, as shown in Liddell Drawing No. 1, is operative, and I regard said model which I have just produced as an adequate reason for such opinion. Under the question, however, I was called upon to consider the testimony, on this subject, not only of William Liddell (which I have already considered), but also that of Mr. Charles D. King, as given on his recall of April 3rd, 1903, and of Mr. Wilbur M. Stone, as given on his recall of May 4th, 1903.

Mr. King testifies that he laid out the Liddell Drawing No. 1, and that in doing so he "exercised the skill to make it mechanically correct, according to his (Liddell's) scheme" (question and answer 35, page 786-7, D. P. R.).

In question 53 Mr. King was asked if he had given "mathe-"matical, theoretical consideration to the question whether it "would be possible to so change the form and proportions of "some or all of the parts shown in Liddell Drawing No. 1, as "to cause the edge W, of the plate E, to accompany the notch "in the cylinder C (which is shown under that edge in Liddell "Drawing No. 1) at the same speed with the forward move-"ment of that notch, as the cylinder would be revolving in the "direction of the arrow shown thereon, in Liddell's Drawing "No. 1." Mr. King replied that he had and, being asked his conclusion, he stated, in answer to Q. 55, that "it could not be done, with these elements as shown in the drawing." Question and answer 56, page 790, read as follows:

> "Q. 56. Could the edge W be made to accompany the "notch in the cylinder under that edge, with these ele-"ments shown in Liddell Drawing No. 1, *if those elements "were to be changed in form or proportion, without being "changed in number or arrangement?*
>
> "A. I do not think it could"

Being then asked what characteristic belongs essentially to the mechanism shown in Liddell Drawing No. 1, which must make it impossible for that mechanism, *by any change of form or proportion*, to cause the edge W of the forming-plate to

accompany the notch in the cylinder during the forward move- 8
ment of that notch, Mr. King gives some very conclusive reasons, as they appeared to him, and finally, in answer to Q. 59, says:

> "I do not believe it possible to make any change in "proportions of the parts, so as to accomplish this result."

Mr. King's testimony on this subject, giving multiplied statements and reasons, alleging and proving inoperativeness of this Liddell device, is very amusing in the light of the operative model which I have just produced, and so much of his testimony is really formulated in the questions asked him by Mr. Walker that the latter gentleman looks rather funny too.

In his cross-examination Mr. King says, in answer to x-Q. 99, that Mr. Liddell "is certainly mistaken" in thinking the 8
construction shown in Liddell Drawing No. 1 is operative, and elsewhere in his cross-examination he says he started out thinking the device of that drawing was operative, but after a few days given to the work of investigating it he saw that "it would be inoperative."

Mr. Stone was asked at Q. 5 whether he had considered the question "whether the machine of Liddell Drawing No. 1 "can be made (either *with or without changes in form or pro-* "*portion of its parts*) to have the mode of operation which Mr. "Liddell set forth in Section 11 of his affidavit," and, after replying that he had "given careful and extensive consideration to the matter of this question, and had reached a conclusion thereon," he stated, in answer to Q. 6, what that conclusion 86
was in the following words:

> "I have found by a close and complete analysis that *it* " *would not be possible* to construct the machine composed "of the parts of Liddell Drawing No. 1 *in any contours or* "*proportions of said parts*, in such a way as to enable that "mechanism to have the mode of operation which Mr. Lid- "dell expected it to have; or indeed, *to be operable at all.*"

In answer to the next question, Mr. Stone gives more than upwards of four pages of reasons, which have the appearance of much learning and patience, but all of which are completely

refuted by the little brass diagramatic model I have produced, and which works all right.

In answer to Q. 8, page 810, Mr. Stone sets forth on about five printed pages "what essential changes must be made in "the mechanism of the Liddell Drawing No. 1 in order to enable "such mechanism to properly operate the plate E of that draw-"ing." And in this connection he produces "Defendant's Drawing No. 17" by which he shows to his own satisfaction that the thing cannot be done at all, concluding his answer with this statement (page 815, D. P. R.):

> "It will thus be seen from Defendant's Drawing No. 17 and the movements of the parts shown therein, necessary to cause or compel the edge W of the plate E to properly co-act with the notch across the cylinder C, and to do its part of the work of opening up the forward part of a tucker paper tube, that *these movements are both theoretically and practically impossible* to the mechanism of the Liddell Drawing No. 1, *even by any possible changes in the contours or proportions of any or all of the parts thereof.* It will therefore be seen that the machine of the Liddell Drawing No. 1 *is inoperative and useless* to open out the forward end of a tucked paper tube, and fold the same down into a diamond form" (italics mine).

But the little brass diagrammatic model, mounted on a yellow board, which I have above produced, tells a very different story, and I believe the model. Said model is also, in my judgment, a perfect justification of Mr. Liddell and his invention, except as to his long-distance memory.

[*Adjourned to Wednesday, November 25, 1903, at 10:30 A. M.*]

Wednesday, November 25, 1903.

[*Met pursuant to adjournment.*]

Present—The Notary, and Counsel as before.

[*Adjourned to 2 P. M.*]

2 P. M.

[*Met pursuant to adjournment.*]

Present—The Notary, and Counsel as before.

(Mr. Dayton continues his answer to Q. 261.)

It appears, therefore, that Mr. Liddell took to Mr. Hunter, on or about September 23, 1895, the subject matter for two applications for patent, (as either then or later decided to be presented to the Patent Office), the underlying idea of both which was a forming-plate for a tucked paper bag machine, equipped with end and side fingers, and having two axes of which one was at the creasing edge of the plate, and the other remote from said creasing edge. In one of the machines this peculiar forming-plate was to be combined with a rotarily reciprocating bed, and in the other the plate was to be combined with a continuously-advancing, rotary bed. The first mentioned of these machines is shown in the Liddell Patent, No. 564,288, and the other in the Liddell Patent in suit, No. 558,969. It also appears that, as to the proposed machine having the rotary bed, Mr. Liddell had two schemes for the return movement of the forming-plate after it had done its work in the formation of the diamond, one by continuous rotation of the forming-plate on its second and supporting axis, and the other by arresting its rotation on this axis after doing its diamond-forming work, and swinging it back to its starting place, instead of continuing its forward rotary motion to its starting place. It is not quite clear, as it seems to me, whether at the time he took the cases to Mr. Hunter, he had fully elaborated the mechanism for swinging the forming-plate back to its starting place, but that he had shown or said something of this particular way of returning the forming-plate is indicated, as it seems to me, by the fact that Mr. Hunter, in his original draft of the specification, referred to the *oscillation* of the plate, as well as to the *rotation* of said plate, about its supporting axis, *c* as a center. The original statement is found at about the middle of the middle paragraph on page 6 of the original draft, as found in Com-

plainant's Exhibit Hunter File of Case A. I quote the origina sentence with its immediate predecessor, as follows:

> "As soon as the tube has been withdrawn from the plate E the said plate is caused to return to its original position by the operation of the arm F so that it shall be in its proper position to receive the next paper tube. The gear M′ is stationary and as the arm F is oscillated about *f* as a center the intermediate gear M and gear N cause a proper *rotation or oscillation* of the plate E about *e* as a center." (Italics mine.)

It further appears, now, that both of Mr. Liddell's plans for returning the forming-plate to its starting place after doing its work in forming the diamond upon the continuously rotating bed, are operative, and that they were equally novel. That, in fact, they were merely formal or structural modifications of one and the same radically new invention. The broad claims, originally prepared to cover the invention generically, were not changed with respect to this matter when, at the final interview of January 7th, 1896, the reciprocating form of mechanism for returning the forming-plate was decided upon for illustration in the patent drawings.

[*Defendant's counsel objects to the foregoing answer of six thousand words to Q. 261, on the same grounds as those upon which the objection to that question was based; and also because the answer treats of a number of subjects not within the scope of the question; and also because the answer contains many statements of secondary evidence; and also because the answer contains much matter in the way of opinion on questions of law; and also because the answer is a partisan argument based upon some facts and some fiction confusedly mixed together, while carefully omitting other facts already proved in the record, which, if attended to, would show the argument to be invalid in many of its parts and in its general drift and conclusion.*]

[*Complainant's counsel offers in evidence the diagrammatic model produced by the witness in connection with his last answer, and the same is marked "Complainant's Exhibit Opera-*

tive Model from Liddell Drawing No. 1." A. B. C., Notary Public, Nov. 25, 1903.]

[*Defendant's counsel objects to the model last offered in evidence, on the following grounds:*]

[*First. The model is essentially out of conformity to Liddell Drawing No. 1 because when the edge W of its plate or part E reaches its place on the periphery of the cylinder C, it is only 20 degrees back from the radial line connecting the center of the shaft cap B with the center of the shaft e whereas in Liddell Drawing No. 1 the plate E is 60 degrees back from the same radial line when its edge W reaches its place on the periphery of the cylinder C.*]

[*Second. The model clearly appears to be inoperative in a paper bag machine in the light of Defendant's Drawing No. 17, as that drawing is explained by defendant's witness, Stone, because the testimony of Mr. Stone shows that the plate E must occupy the tangential position shown in Defendant's Drawing No. 17 when its edge W reaches its place on the periphery of the cylinder C, and which tangential position involves reaching that place as far backward on the cylinder as the numeral 1 in Defendant's Drawing No. 17; whereas in the model the edge W of the part E does not reach its place on the periphery of the cylinder C until that place is turned forward from the location of the numeral 1 as far as half way between the numeral 5 and the numeral 6 on the periphery of the cylinder C in Defendant's Drawing No. 17.*

[*Third. The model plainly appears on its face to represent a totally inoperative mechanism for working the plate E in a paper bag machine, because the pointer of the model which represents that plate occupies a position so nearly radial to the cylinder C when its edge reaches its place on the periphery of that cylinder, that the plate E represented by that pointer could not by any possibility perform any function whatever toward opening out one end of a tucked paper tube and folding it down into a diamond form.*]

[*Fourth. The fact that the edge W of the plate E can be made to accompany a notch in the cylinder through a compara-*

tively few degrees of revolution of the shaft c by means of the mechanism of Liddell Drawing No. 1, is immaterial to this suit and is no new idea, and not contrary to anything in the defendant's record, and, therefore, not in rebuttal of any of the defendant's evidence.]

[*Fifth. The model is totally out of conformity with the Liddell Patent in suit, in that the model represents the edge* W *of the plate* E *reaching its place on the periphery of the cylinder* C *when that plate is 50 degrees further forward than it is in the drawing of the Liddell Patent, when the edge* W *of that plate reaches its place upon the periphery of the cylinder* C, *and because the Liddell Patent plainly states and shows that the initial position of the plate* E *must be substantially tangential to the periphery of the cylinder at that time, as shown in Fig. 1, and also in Fig. 3 of the drawings of that patent, whereas the model represents the plate* E *as being more nearly radial than tangential to the cylinder* C *when its edge reaches its place on the periphery of that cylinder, which nearly radial initial position of the plate* E *is totally prohibitive of the operativeness in a paper bag machine of the mechanism shown in the model.*]

[*Sixth. The model is the result either of a wilful intention to deceive the court, or of profound ignorance of the problem with which it purports to deal, as the case may be, and in either event it is inadmissible in evidence, except so far as it corroborates the testimony of the defendant's expert, Stone, in connection with Defendant's Drawing No. 17.*]

[*Adjourned to Friday, November 27, 1903, at 10:30 A. M.*]

Friday, November 27, 1903.

[*Met pursuant to adjournment.*]

Present—The Notary, and Counsel as before.

Q. 262. Now, bearing in mind the entire record of testimony and exhibits on the part of the complainant and defendants in this case, to date, (and referring to your opening testi-

mony in the "Woodward & Rogers" suit, if it becomes incidentally necessary), please state, with reference to the paper bag machines shown by said records to have been made for or used by defendants herein:

First. Whether defendant's testimony has resulted in any modification of your views or in necessity of change in your statement thereof, as expressed on the opening case.

Second. How the Walker model-room machine, being defendant's embodiment of its machine in this case, compares with Complainant's Exhibit Defendant's Machine of the opening case, and

Third. Consider such of the testimony of defendant's witnesses, particularly any expert witness, as may tend to negative infringement of the Liddell Patent in suit by the defendant's paper bag machines as proved in this case, and make such answer thereto as you find justified by the state of the art, and by a comparison of defendant's machine with claims 1, 2 and 7 of the Liddell Patent, as to said machines being covered by said claims.

[*Defendant's counsel objects to the foregoing question on the following grounds:*]

[*First. The "views" of the witness, as expressed by him in the opening case, are quite immaterial to the suit, because he did not at that time admit that he knew anything whatever about the prior art, and because he did not at that time have any practical knowledge of self-opening square paper bag machinery of any kind, and because he did not at that time know the construction of the defendant's self-opening square paper bag machinery, or any of it; and the question whether those uninformed and immaterial views have been modified during the year and a half which has passed since they were stated in the opening case is immaterial to this suit.*]

[*Second. The question how the Walker Model Room Machine compares with Complainant's Exhibit Defendant's Machine is immaterial; because that Complainant's ex-*

billi does not accurately represent any machine of the defendant.]

[Third. It is totally improper to ask the witness to "assume" the voluminous testimony of the defendant's witnesses where that testimony appears to require interpretation of the Exhibit Patent in suit by the defendant's paper bag machine, because such an "assume," to be complete, must include much matter of argument which is entirely outside of the scope of expert testimony; and it is entirely improper to ask the witness whether the defendant's machine, or any of them, are covered by claims 1, 2 and 7 of the Exhibit Patent, that being a question of law upon which the opinion of the witness is unbecoming.]

[Defendant's counsel suggests to complainant's counsel that the latter may ask the witness to point out any item of fact which he has discovered in the testimony of the defendant's witnesses referred to, inadvertently or otherwise, or any conclusion suggested by them, or adduced in the case, and may then ask, or at least endeavor to elicit, any testimony that the defendant's witnesses may have given.]

[That defendant's counsel reasonably protects against having the present witness sent to court at still greater cost by the question of fact and of law that he may think are involved in the question, whether the defendant's machines infringe claims 1, 2 and 7 of the Exhibit Patent, and to ask the witness to assume that which subsists as if he were acting counsel for the complainant, making the closing argument upon the decision before the court.]

3. I have carefully examined and studied the testimony of defendant's expert, Mr. Dixon, relating to the question of the comparisons and differences between the various defendant's machines and that of the Exhibit Patent, and I have considered and am ready to testify in the matter. I have also compared the prior questions in this deposition propounded to the witness by complainant's counsel with the answers thereto, and have based my testimony upon my examination and study of the machines and the Exhibit Patent. The result of such examination and study is that I find no occasion to modify any of the conclusions expressed by me in the opening case or in the rebuttal case, and to defendant's machines of the invention shown and de-

scribed in the Liddell Patent in suit, and particularly defined in claims 1, 2 and 3 thereof. The prior art, as I have already pointed out, only emphasizes the radical novelty of the Liddell invention and demonstrates the perfect propriety of the broad and generic terms in which the claims of the Liddell Patent are expressed. And I can not ignorant of the prior art as the class of giving my decision in the opening case, as the Workers, in his objection, implies, but was only prevented by instruction of complainant's counsel from explaining the prior art when partially submitted to me in cross-examination in such opening case.

As to the second branch of the question, calling upon me to point out how the Walker Model Steam Machine compares with Complainant's Liddell Defendant's Machine of the opening case, I call to my aid (as the absence of said Walker Model Steam Machine itself from the record), Defendant's Drawing No. 6, Defendant's Drawing No. 9, and Defendant's Drawing No. 10. In Defendant's Drawing No. 6, column 1 shows the valve taken from the Walker Model Steam Machine, with which also corresponds the first figure of column 2 in Defendant's Drawing No. 9, as first set out. Defendant's Drawing No. 10 is a front and top view of the diamond-bearing device of said machine, being permanently entitled "Walker Model Steam Machine." I also produce a like valve device in perspective of the diamond-bearing device of the Walker Model Steam Machine, showing in Fig. 1 the diamond-bearing parts in their positions at the time the Work has been finished and when about to begin to act thereon, in Fig. 2 the diamond parts reversed, and in Fig. 3 the diamond parts fully opened. This last print is entitled "Complainant's Liddell Drawing Walker Model Steam Machine—Perspective View."

The four figures of the right-hand column in Defendant's Drawing No. 6 are specifically identified with the Walker Model Steam Machine in the owner's exposition, exercise and exercise [illegible] 1892 [illegible] I do not at this moment find a specific identification of the figures in column 1 of Defendant's Drawing No. 6 with the Walker Model Steam Machine, by Defendant's testimony, but such reference thereto as there is, in column 2, section of "Defendant's machine." From and

sonal examination of said Walker Model-Room Machine, however, I am able to say that it is represented in said third column of Defendant's Drawing No. 8.

Comparing these several drawings of Defendant's Walker Model-Room Machine with "Complainant's Exhibit Model of Blank Feeding and Diamond-Forming Parts of Continental Bag Machine" (as the same is entitled in Eastern Paper Bag Company *versus* Continental Paper Bag Company), it will be seen that the cylinder of said complainant's model is essentially like that of defendant's machine as shown in Defendant's Drawing No. 9, the difference being that in Drawing No. 9 the cylinder has three beds and in the model only two. The cylinder is peripherally recessed in the same manner to accommodate the movable sections thereof, which constitute the "beds" proper, and which move inward and outward in the diamond-forming operation to allow the oscillating tucker-plate to swing opposite the same, and to preserve the proper relation of the bed to the creasing edge of said tucker or forming-plate in such diamond-forming operation. The tucker-plate being shown going through its diamond-forming movement in column 3 of Defendant's Drawing No. 9, not only is this inward and outward movement of the yielding bed shown in said drawing, but also the slight degree, or extent, of such inward and outward movement of the several beds. The same thing is shown in Complainant's Exhibit "Drawing Walker Model-Room Machine—Perspective Views," the middle Figure 2 of which shows the extreme inward movement of the pivoted bed 56 to be only about 3-16 of an inch at its free extremity.

[*Recess.*]

The tucker-plate of the Walker Model-Room Machine is exactly like the tucker-plate of the model in being externally supported on an axis of oscillation remote from the creasing edge of the plate, and in both cases in line with the outer corners of the triangles of the diamond fold, as distinctly shown by the dotted axial line in "Complainant's Exhibit Drawing Walker Model-Room Machine—Perspective Views." In both machines, also, the tucker-plate is provided with a central finger for entering the ends of the tubular blank, and with side clips or fin-

gers for entering the side tucks of the blank, and defining the fold of the triangle belonging to the upper ply. In both, also, the side fingers and central finger co-operate in lifting the upper ply away from the lower ply in spreading the diamond, in precisely the same way. The side fingers for lifting the upper tucks and ply with the forming-plate operate in one case exactly as in the other, but are differently mounted and actuated. In other words, the outside mechanism for throwing the fingers into action, and for retracting them, are formally dissimilar. In the model the side fingers have their edges beveled or inclined to correspond with the angular folds of the triangle and they slide cross-wise of the blanks into the tucks and out again, being made to clamp the tucks as they enter and to release the tucks as they recede. In the Walker Model-Room Machine the side fingers 62 (see Defendant's Drawing No. 11 and Complainant's Exhibit Drawing Walker Model-Room Machine—Perspective Views) are elbowed arms on short rotating shafts journaled in the arms 300 and are oscillated into and out of the side tucks, instead of being longitudinally reciprocated, as in the model. In the model, also, the tucker-plate is a single, integral plate against the sides of which the side fingers press the paper of the upper tucks. In the Walker Model-Room Machine the side portions of the tucker-plate against which the side fingers press the upper tucks of the blank are detached from the remainder of the plate so as to yield slightly, if necessary, to the pressure of the side fingers. These detached side portions of the tucker-plate are shown at 500, 500, in Defendant's Drawing No. 11, and in Complainant's blue-print exhibit. This feature is obviously a mere refinement over the model and in no-wise changes the essential construction or operation.

The tucker-plate of the model is fastened to the continuous shaft which forms its axis of oscillation, but in the Walker Model-Room Machine the shaft is divided and its parts rigidly connected by a frame composed of the arms 300, 300 projecting to one and the same side of the line of the shaft, and connected at their outer extremities by a cross-bar also marked 300 in Defendant's Drawing No. 11. The arms and connecting cross-bar constitute what has been called the tucker-plate "frame."

the tucker-plate being fastened to the cross bar by screws as shown in both Defendant's Drawing No. 11 and Complainant's blue-print. This gives attachment of the tucker-plate at its back edge in the Walker Model-Room Machine, and across its middle in the Complainant's model. But the axis of rotation or oscillation of the tucker-plate is precisely the same distance from the creasing edge of the plate in both machines when for making bags of the same size. This difference is also obviously one of merely mechanical construction, or design, having no effect whatever to give a changed mode of operation.

The intermediate gear mechanism for oscillating the tucker-plate in harmony with the rotation of the cylinder is essentially the same in the Walker Model-Room Machine as in Complainant's model. In the latter it consists of a pinion on one end of the shaft supporting the tucker-plate, which pinion intermeshes with a sector-gear on the end of an arm pivoted between its ends and provided with a roller on its arm opposite the sector gear which is engaged with a cam that is geared with the cylinder shaft. The only difference between the two machines in this particular is that in the Walker Model-Room Machine the cam is a grooved cam and in the model it is an edge-cam with a spring for holding the roller against the rotary cam. In Defendant's Drawing No. 11 the pinion on the tucker-plate shaft is seen at 85, the sector-cam lever at 86, and the grooved cam at 90. The shaft 17 of the cam 90 carries a gear wheel 16 which meshes with the cylinder gear 52.

As a mere incident to the different form and different movement into and out of the tucks, of the side-fingers belonging to the tucker-plate, the actuating devices for these fingers are, of course, correspondingly different, but these matters may be infinitely varied by the same or different constructors, and obviously cut no figure whatever in a comparison of the essential features of the two machines.

Coming to the cylinder of the model and that of the Walker Model-Room Machine, it may be noticed that the end-clip for seizing the end of the lower ply of the bag blank is shown as a single clipping finger in the model and as a double clip 61, 61 in Defendant's Drawing No. 11 and in Complainant's blue-

print exhibit showing the Walker Model-Room Machine. This is also a merely formal difference in no-wise affecting the question of essential similarity. Any question on this point is forestalled by the statement of Mr. Stone in answer to Q. 42, page 244, D. P. R., where he says:

> "In the Walker Model-Room Machine, as set forth in Defendant's Drawing No. 11, the double front clip 61 conforms substantially in its operation to the front clip *c* of the Liddell Patent, which has been shown to be old in the art."

As the cylinder clip *c* of the Liddell Patent is essentially like the central cylinder clips of Complainant's Model of Defendant's Machine, the single clips of the model are essentially like the double clips of the Walker Model-Room Machine.

As to the side clips carried by the several beds on the cylinder, there is no difference between Complainant's model and Defendant's Walker Model-Room Machine except that in the model said clips are moved into inward active position by springs and are retracted by cams, while in the Walker Model-Room Machine the reverse is true—that is, they are moved inward into active position by the cams and are retracted by springs. But this is not a material difference, as Mr. Stone in effect admits where, in answer to Q. 27 and near the top of page 220, D. P. R., finding the same difference between the clips 61, 61, of Defendant's Walker Model-Room Machine and those of the prior art, as shown in Figs. 4 of Defendant's Drawing No. 8, he says: "This difference, however, "is one of arrangement, and not of kind."

Now, taking up Mr. Stone's testimony on the subject of correspondence between the Walker Model-Room Machine and the machines of the Continental Paper Bag Company, at Rumford Falls, Maine, represented in all material features of construction and operation in Complainant's model above referred to, such testimony of Mr. Stone begins with his answer to Q. 52, page 253, D. P. R., the question opening with the following statement:

"Q. 52. Your testimony in respect of the construction

and character of any machine of the defendant, the Continental Paper Bag Company has thus far been confined to the Walker Model-Room Machine?"

The question continues:

"But I now ask you to state the character of the self-opening square paper bag machines which you examined in the factory of the Continental Paper Bag Company in Rumford Falls, Maine, as stated in your answer to Q. 4, so far as those machines differed from the Walker Model-Room Machine?"

Mr. Stone, in answer to Q. 53, says that "Not more than three or four" of the Rumford Falls machines, when he saw them in November, 1902, had the tucker-plate frame 300 carrying the tucker-plate 82 and the diagonally journalled side clip 62 of Defendant's Drawing No. 11. Describing the other 53 or 54 machines at Rumford Falls with respect to the construction and mounting of the tucker-plates and their side clips, he says, in answer to Q. 54, that they "were like, in gen-"eral, that set forth in Figs. 18 and 19 of the Claussen & Mort-"sen Patent, No. 635090, but differed more or less *in minor de-"tails* of design and mode of operation."

In Q. 56 Mr. Stone was asked to closely examine again the third column of Defendant's Drawing No. 9, and state whether it conformed in all respects to all of the 57 self-opening square paper bag machines which you saw in the factory of the Continental Paper Bag Company, and *also* to the Walker Model-Room Machine, as far as the four figures of that column purport to represent the Defendant's Machine, and his answer was in the affirmative.

His attention was then called to Defendant's Drawing No. 11, and he stated, in answer to Q. 57, that this drawing No. 11 "conforms in all respects, except in respect to the tucker-"plate 82 and the operating mechanism thereof," with the 57 Rumford Falls Machines. In the next answer (to Q. 58) Mr. Stone said, as to the difference between the tucker-plates that:

"The tucker-plate of the Walker Model-Room Machine is divided into sections numbered respectively 82 and 500,

500; whereas the tucker-plates of the machines inquired of have their tucker-plates integral, of one piece, and are not divided into sections as in the tucker-plate of the Walker Model-Room Machine."

In his answer to Q. 59 Mr. Stone explained that in the 57 Rumford Falls machines "the bevel-edged side nippers 103 and "104 [belonging to the tucker-plate] of the Claussen & Mortsen "Patent, No. 635090, were used in the place of the bevel-edged "side clips 62, 62 [of the tucker-plate] of the Walker Model-"Room Machine." And that "These bevel-edged side nippers "are operated in a manner set forth in the Claussen & Mortsen "Patent."

He then describes the mounting and operation of said side nippers of the Claussen & Mortsen Patent, from which it will appear that Complainant's Exhibit Model correctly represents the 57 Rumford Falls Machines in this particular.

The substantial identity of the Walker Model-Room Machine and the Rumford Falls machines, and hence the "Complainant's Exhibit Model of Blank-feeding and Diamond-Form-"ing Parts of Continental Bag Machine" seems to me to be attested by Mr. Stone, if not also acquiesced in by Mr. Walker, by the following question and answer, page 257:

"Q. 60. What difference, if any, exists among any of the self-opening square paper bag machines of the Continental Paper Bag Company, in respect of their relation, or want of relation, to the Liddell Patent, No. 558969?

"A. *There is no such difference existing among any of those machines.*"

I agree with this statement of Mr. Stone. For the purposes of comparison with the Liddell Patent in suit, and particularly with claims 1, 2 and 7 thereof, here in litigation, I am of the opinion that the differences between the different forms of defendant's machines are to be regarded as merely formal, and in no degree affecting the question of correspondence or difference between said defendant's machines and the subjects matter of said claims 1, 2 and 7 of the Liddell Patent sued upon. All of defendant's machines, in my opinion, alike conflict with said

Liddell claims or alike evade them. Though formally different in what Mr. Stone properly calls "*minor details* of design and mode of operation" (meaning minor details of operation incident to minor details of design), they are essentially the same machine, embodying the same fundamental principles of construction and operation, and produce the same results in practically the same way, and by practically the same means. And in all of these respects, in my opinion, they follow the Liddell Patent in suit, and conform with claims 1, 2 and 7 thereof.

[*Adjourned to Saturday, November 28, 1903, at 10:30 A. M.*]

Saturday, November 28, 1903.

[*Met pursuant to adjournment.*]

Present—The Notary, and Counsel as before.

(Mr. Dayton continues his answer to Q. 262.)

The comparison made between defendant's machines and the machine of the Liddell Patent in suit by Mr. Stone is a piece-meal comparison, and is made between "minor details" rather than between the broad and general features and combinations which characterize both machines alike and are originally found in the Liddell Patent in suit. And I find nowhere in defendant's testimony any contention that defendant's machines do not contain such broad features and combinations of the Liddell Patent, or that the defendant's machines do not respond to the generic terms of the claims 1, 2 and 7 of said Liddell Patent, here in suit. For example, it is not denied that defendant's machine has a tucker-plate having an axis of support external to and independent of a rotary bed structure and remote from the creasing or working edge of said tucker-plate; it is only contended that the supporting axis of the plate is not so far away from the creasing edge as shown in the Liddell Patent. It is also not contended that in defendant's machines the tucker-plate does not oscillate on its second, external and independent axis opposite a continually rotating bed or cylinder, nor that said plate does not "oscillate about its rear [creas-"ing] edge upon the surface of the cylinder during the rotary

"movement of said cylinder"; it is only contended that the cylinder is not a cylinder, because it has gaps in its periphery and portions of its periphery are radially movable. It is not contended that to enable the tucker or forming-plate "to oscillate "about its rear edge upon the surface of cylinder during the "rotary movement of said cylinder * * * for the purpose "of opening and forming the bottom of the bag tube," the distance between the surface of the cylinder and the external and supporting axis of the plate is varied to let the plate so oscillate, but only that in defendant's machines the surface of the cylinder moves from and towards the supporting axis of the plate instead of such supporting axis of the plate moving from and towards the surface of the cylinder, as shown in Liddell's illustration of his invention. It is not contended that the tucker or forming-plate of defendant's machines is not provided with an end finger and side tuck-fingers, but only that the side tuck-fingers are different in form and mounting from those shown in the Liddell patent, and that the end finger is longer and closer to the plate than shown in the Liddell Patent—these fingers of defendant's machines being pointed out as well known in the art long prior to the Liddell Patent, without recognition of the fact that Liddell's claims in suit are not restricted to any particular form of fingers, and that any old fingers were available for Liddell's invention as actually claimed. In short, the broad invention of Liddell, and the generic terms of the Liddell claims in suit, appear to be wholly ignored in defendant's testimony and the distinctions between defendant's machines and the claims in suit are drawn between "minor details of construction," which the claims do not specify, and which the specification accompanying said claims treats as variable and immaterial.

It thus appears that defendant's contention is, not that defendant's machines do not contain the invention of Liddell as generically defined in the claims 1, 2 and 7 of the Liddell Patent in suit, but only that said invention is clothed in a different garb. Shakespeare did not pretend to announce a universal rule when he said "apparel *oft* proclaims the man," and he did

not include machines and inventions in this announcement, or refer to apparel chosen for the purpose of disguise.

The piece-meal comparison made by Mr. Stone between defendant's machine and that of the Liddell Patent begins with his discussion of Defendant's Drawing No. 8, and more particularly with the second paragraph on page 216, D. P. R. He begins with the cylinder which he insists upon calling, in defendant's machine, a "conveyor." In this nomenclature he follows the Claussen Patent, No. 598,497, which he elsewhere mistakenly traces back to the Claussen sketch "Claussen Exhibit No. 3," apparently forgetting that Claussen himself, on said sketch No. 3, called the corresponding part a "cylinder" *six times.*

Mr. Stone also says in this paragraph:

> "The front clip 61 trunnioned upon the same pivot 57 on which the oscillating carrier vibrates, has a markedly different construction from the Liddell front clip."

Though he says later in answer to Q. 42:

> "The double front clip 61, conforms substantially in its operation to the front clip *c* of the Liddell Patent."

As to the side clips belonging to the cylinder, Mr. Stone points out, on page 216, that

> "The side clips 67 [of defendant's machine, shown in third column of Defendant's Drawing No. 8] operate in a plane at right angles to the bag blank, and clamp said bag blank against the fold-bed, and are of a type quite distinct in design and operation from both Liddell and the prior art."

Overlooking the precisely similar side clips 68, 69, shown in the Lorenz & Honiss Patent, 337,965, and with particular plainness in Figs. 11 and 12 thereof. And if Mr. Stone had proposed to be exhaustive on this subject he could have pointed out that the Liddell side clips on the cylinder were also old, as, for example, in both the Stilwell patents here in evidence, and in the Lorenz & Claussen Patent, No. 534,512.

Next, in connection with Defendant's Drawing No. 8, Mr. Stone, on page 217, D. P. R., speaks of the tucker or forming-plate, shown in Figs. 2 of said Drawing No. 8. He points out that in the tucker-plate 67 of the prior art column, taken from the Lorenz & Honiss Patent, No. 337,966, "the axis of support "of the tucker-plate coincides with the axis of oscillation, and "also with its defining edge; while in the Liddell forming-plate "[middle column] the axis of support is remote from the axis "of operation." He then says of defendant's forming-plate of the third column of the Drawing No. 8.

> "The tucker-plate of the defendant's machine is no more like that of Liddell than it is like that of the prior art; in that its axis of support and its axis of oscillation is neither at its defining edge nor at the edge opposite thereto, but *is midway between those edges.*"

If it is not at the defining edge, but is midway between the edges of the plate, it is, of course, "remote from" the defining edge, which are precisely the terms which Mr. Stone himself uses to define the position of the supporting axis in the Liddell plate. The Liddell tucker or forming-plate is, therefore, even according to Mr. Stone, like that of defendant's machines in having the supporting axis "remote from the axis of operation," or in other words, from the creasing or defining edge, and it is not true that the tucker-plate of defendant's machine is no more like that of Liddell than it is like that of the prior art.

And on this point it is to be noted that the Liddell Patent does not define any exact distance at which the independent supporting axis of the tucker-plate must be away from the creasing or defining edge. The plate might be made twice or ten times as wide as it is shown to be in the Liddell Patent and its supporting axis retained in its present position, in which case said supporting axis would not be "at the edge opposite" the defining edge, to which opposite edge Mr. Stone would limit it. Said supporting axis is "remote from the defining edge" in the Liddell Patent and in the defendant's machines, and for identically the same reason, to wit: to give opportunity for the travel of the creasing edge of the plate upon or adjacent to "the surface of the cylinder during the

"rotary movement of said cylinder * * * for the purpose "of opening and forming the bottom of the bag tube," while the plate is bodily supported and retained in a definite position opposite the cylinder for repeated coaction with the latter in the formation of a succession of diamonds upon a succession of tucked paper tubes traveling with the cylinder surface. The machines are, therefore, substantially alike in this respect, in construction and operation, and the difference in the distance at which the second and supporting axis of the forming-plate is placed from the defining edge in the two machines is wholly immaterial to the question of infringement. And this is true notwithstanding defendant's machines are in this particular respect inferior to the machine of the Liddell Patent. They *are* inferior in this particular, because the nearer the supporting axis of the tucker-plate is to its creasing edge, the less the time given to the operation of forming the diamond by means of such plate, and the less the length of the arc of the cylinder through which the creasing edge of the forming-plate travels therewith. But this is not a difference in principle or mode of operation, but one of design or construction merely—showing lack of judgment, perhaps, on the part of the imitator, and, possibly, lack of full appreciation of the Liddell Patent disclosure, and even, it may be, showing a lack of disposition to imitate the Liddell Patent too closely in detail, but showing no lack of appropriation of the essential invention of the Liddell Patent.

[*Recess.*]

This provision of a second axis on the forming-plate, remote from the creasing or defining edge of said plate, and for the support of the plate independently of the cylinder, is the one fundamental and vital feature or condition of "operating means "for the forming-plate adapted to cause the said plate to os- "cillate about its rear edge upon the surface of the cylinder "during the rotary movement of said cylinder," mentioned in each of the Liddell claims in suit. A dozen or fifty variations in such operating means may be made provided this single requisite be retained, and it will constitute the "heart and core" of all of them. Defendant's Drawing No. 8 shows that this was

new with Liddell, and that defendant's machines contain it. And these facts are not negatived, or obscured, by the thimble-rigging statement of Mr. Stone found in the middle sentence on page 217, D. P. R., above quoted.

Nor, in my judgment, is the fact of appropriation of this feature of the Liddell invention and patent in defendant's machines at all mitigated by the fact, next pointed out by Mr. Stone on page 217, that, in defendant's machine as shown in Fig. 2 of the third column of Defendant's Drawing No. 8 "the "bevel-edged side nippers vibrate in a plane normal [perpendic-"ular] to the bag tube," and that, in this mere detail, said side nippers or fingers" resemble the side nippers 82 of the prior art, "as shown in Fig. 2 of the first column of Defendant's Drawing "No. 8, much more closely in design and mode of operation "than they do the side forming fingers" shown in the Liddell Patent. The special design of the side forming fingers is not vital to the essential invention of Liddell. They are mentioned in the claims in suit in the most generic terms, as follows, viz.: "a forming plate also provided with side forming fingers adapted "to be moved towards or from each other." The side forming-fingers of the older art, as shown in the Lorenz & Honiss Patent, 337966, and copied to form Fig. 2 of the prior art in Defendant's Drawing No. 8, would answer Liddell's purpose and would comply with the claims in suit just as well as the particular fingers H H which he has chosen to show in his patent, and they were open to him in the building of a machine under his patent, if on the whole he preferred them. It is my understanding that the defendant, while taking the essentials of the Liddell Patent, has not escaped its broad claims by a variation in such adjunctive details, such as Liddell himself might have made in putting his invention into practice.

Next, Mr. Stone, on the same page, points to the change in the central finger E′ of the Liddell Patent to the longer and closer finger 82b of defendant's machine, as shown in Fig. 2, column 3, of Defendant's Drawing No. 8, denying that it closely resembles either the finger E′, as shown in the Liddell Patent, or similar fingers in the prior art, although he says on page 231, D. P. R., that this finger 82b was "old in the art, being

"found in the Cross Patent, No. 222464, of December 9, 1879." But, as he admits in cross-examination, in effect, that the elongation of the finger and its closer proximation to the forming-plate is only a matter of mechanical judgment (as is obvious), the difference between defendant's machines and that of the Liddell Patent is in this respect of no moment.

With reference to the means for operating the side clips or fingers on the forming-plate of defendant's machine "at defi-"nite times," as compared with the means shown in the Liddell Patent for operating "at definite times" the differently mounted side clips or fingers illustrated in the patent, Mr. Stone, on page 218, D. P. R., points out by reference to parts A of Figs. 4 of Defendant's Drawing No. 8, that such means in defendant's machines answer to the description which he has made of the prior Lorenz & Honiss devices of Patent No. 337966, shown at A in Prior Art column of said Defendant's Drawing No. 8, and, as he has given a different description of the Liddell operating means for the forming-plate side fingers, he concludes at the top of page 219 that:

> "It will therefore appear that the means provided in defendant's machine for operating the bevel-edged side clips are radically different in construction and mode of operation, from the means for operating the forming-fingers of the Liddell Patent, and that the means employed in the defendant's machine conform much more closely to the prior art than to the Liddell Patent."

Of course, the use of differently mounted side fingers or clips necessarily involves some differences in their actuating mechanisms. But these are not of the essence of the Liddell invention; they are merely details of a machine containing that invention, and necessary to the formation of a diamond on a tucked paper tube in any machine for that purpose, whether it contain the Liddell invention or not. Consequently in my judgment, the difference in this particular cuts no figure whatever in determining whether or not defendant's machines contain the real invention of the Liddell Patent.

Still referring to Defendant's Drawing No. 8, Mr. Stone compares Figs. 3 of the "Liddell" column and "Defendant's

Machine" column with respect to "operating means for the "forming-plate adapted to cause the said plate to oscillate "about its rear edge" omitting the next following words of the several claims in suit, to wit: "upon the surface of the cylin- "der during the rotary movement of said cylinder." In the Liddell column he shows the arms F, or that one of them upon which are mounted the gears M M and N, and upon the axis of which is mounted the gear M′ connected, through the link and slide k, with the cam K on the driving shaft of the machine, together with the cam K′ actuating the arms F through the arm F″. He omits altogether from this figure the only parts which give any meaning whatever to the parts which he has shown, namely, the double-axised forming-plate E having its supporting axis, which is remote from its creasing edge, coincident with the axis of the gear wheel N, and the cylinder, or rotary bed, with which the creasing edge of that forming-plate is made to act in accordance with the terms which he only partly quotes from the claim in suit. What Mr. Stone shows in this Fig. 3 of the Liddell column is solely for the purpose of causing "the said plate to oscillate about its rear edge upon "the surface of the cylinder during the rotary movement of "said cylinder," and in "opening and forming the bottom of the "bag tube." Of what he shows he graciously says, "I am un- "able to find an equivalent in the prior art, and I believe that "Liddell should be accorded unquestioned right * * * * "to these * * * * *." He then compares this Fig. 3 of the Liddell column with Fig. 3 of Defendant's Machine column, saying:

> "This mechanism has nineteen distinct elements; while but five distinct elements are included in the mechanism for vibrating the tucker-plate on its trunnions in the defendant's machine. This defendant's mechanism is shown in Fig. 3 of the third column of Defendant's Drawing No. 8, and its entirely different construction and mode of operation from the Liddell means is at once apparent, as is also its simplicity and directness of action."

It is a professional satisfaction to me to learn from the an-

swers to x-Q. 244 and x-Q. 245 that Mr. Stone is not responsible for the preparation of Figs. 3 of this Defendant's Drawing No. 8, but that, so far as these figures are concerned, it is in the form in which it was submitted to him by defendant's counsel, Mr. Walker. Nothing, in my judgment, could be more unfair than Fig. 3 of the "Defendant's Machine" column as a representation of "operating means for the forming-plate, adapted to "cause the said plate to operate about its rear edge upon the "surface of the cylinder during the rotary movement of said "cylinder * * * * for the purpose of opening and forming "the bottom of the bag tube." These means in defendant's machine include not only the forming-plate and the cylinder, not shown, but also the pivotal mounting of peripheral sections of the cylinder, and the cam mechanism and its adjuncts by which the tucker-plate is enabled to rock past its supporting centre and by which, while so rocked, its rear or creasing edge is enabled to preserve its proper relation to "the surface of "the cylinder during the rotary movement of said cylinder" in "opening and forming the bottom of the bag tube." And there is also omitted from Fig. 3 of the Defendant's machine column all members or the gearing by which the forming-plate actuating mechanism is co-ordinated with the cylinder, while in Fig. 3 of the Liddell column the gear-wheel M^2 of this connecting mechanism is carefully shown. In defendant's machine this connecting gear is on the shaft of the cam, and is shown at 16 in Defendant's Drawing No. 11, "Walker Model-Room Machine."

But it is not a question, as I view it, of the number of parts in the several mechanisms for the same purpose, for such number of parts in either machine may be varied. It is a question, in my judgment, whether the machines are or are not substantially alike in the use of substantially the same double-axised forming-plate in combination with a continuously rotating cylinder or series of beds. A difference exists here between the two machines being compared that is distinctly noticeable to the eye, but in my opinion that difference is only formal and mechanical, and not vital or fundamental. It is simply the difference between moving the supporting axis of the oscillat-

ing tucker-plate towards and from the periphery of the cylinder to let the working edge of the tucker-plate swing past its supporting axis in a constant relation to the periphery of the cylinder, as shown in the Liddell Patent, and moving the periphery of the cylinder towards and from the supporting axis of the tucker-plate for exactly the same purpose, as in defendant's machines. Liddell chose the former plan, and used appropriate devices for the purpose; defendant has chosen the latter plan, and has used appropriate devices for the purpose. As a result, the two machines, employing the same fundamental instrumentality of an oscillating tucker-plate supported independently of the cylinder upon an axis remote from its working edge, perform exactly the same work in the same way. No one ever did this before Liddell, and having shown in his patent how to do it by a movement of the supporting axis of the tucker-plate from and towards a cylinder with a fixed periphery, it was entirely obvious, in my judgment, that it might also be done on the plan of making the periphery of the cylinder movable toward and from a fixed supporting axis of the tucker-plate. And I find the best of support for this opinion inthe testimony of Mr. Stone himself, who declares the giving of such movement to the periphery of the cylinder to be distinctly more obvious than that of giving movement to the axis of the forming-plate. He makes this statement, as I understand him, without reference to one having preceded the other, but it follows that after Liddell had shown one of these plans in his patent, the other follows as a matter of course. On this point I quote from Mr. Stone's cross-examination:

> "x-Q. 248. As a matter of fact, you find in Claussen Exhibit No. 5, and the tracing thereof (Claussen Exhibit No. 6), the same interference between the oscillating tucker and the cylinder, that is shown in Claussen Exhibit No. 3, is it not so?
>
> "A. This pencil drawing is so crude in some respects, that it is rather difficult to read some of its features fairly; but there seems to be a similar interference in the sketch of the Claussen Exhibit No. 5, between the tucker-plate and the faint outline of the cylinder.

"x-Q. 249. Taking the Claussen Drawings Nos. 5 and 3, as you find them, and not improving on or varying from Mr. Claussen's representation of his own conception, the drawings present in effect a mechanical problem, in that the machine obviously would not operate as shown, and two of its mechanical solutions would, I think, occur to any skilled mechanic, to wit: either to recess the carrier cylinder, to permit the passage of the tucker edge, or to give the tucker itself an additional motion, which would enable it to pass over the surface of the cylinder in its oscillation. Do you not, as a skilled mechanical engineer, agree with me in this matter?

"A. I agree with you only partially; in that the two solutions suggested are not, by any means, in the same class, the former being simple and direct, and the latter complex and indirect.

"x-Q. 250. But, apart from your opinion as to relative advantages of the two plans, I understand you to agree with me in thinking that they were both obvious?

"A. I would not characterize the second one (the additional movement of the tucker-plate) as obvious. As I cannot imagine a man capable of designing the machine set forth in Claussen Exhibit 3 as floundering to the extent of ignoring the first solution, which appears to be obvious, and taking up the second suggested solution, with the marked changes it would probably involve.

"x-Q. 251. The question I want you to consider and answer is simply this: Having planned the machine to the extent shown in the two Claussen Exhibits, and developed the interference shown in both of them, was it not perfectly evident that there were two ways of avoiding that interference, one by removing the carrier cylinder at the point where it interfered, and the other by so manipulating the tucker that it would travel over the unmutilated cylinder. I wish you to dismiss from your mind the consideration of the relative advantages of these plans in a paper bag machine, and to answer the question simply from a mechani-

cal point of view, and as a mechanical engineer, and not an expert in paper bag machinery?

"A. I consider the relative advantages of the plans as inherent in the proposition, and that as a mechanical engineer, I cannot give a fair answer to the question, divorced from such relative advantages. I believe that the second solution [movement of the tucker-plate] would not occur to a mechanical engineer in this connection, in view of the fact that the first solution [the recessing of the cylinder] is so obvious and full a solution. This, I think, is true whether the mechanical engineer was or was not an expert in paper bag machinery.

"x-Q. 252. I am then to understand that you give it as your opinion that, had the problem of the Claussen Drawing been presented to you, you would not have recognized that the interference could be avoided by giving the oscillating tucker such a motion as would enable it to follow the surface of the cylinder?

"A. I think the proposition would not have presented itself to my mental recognition; as the other solution would have been so obvious to me as to preclude the necessity or desirability of any other solution.

"x-Q. 253. It appears that the adoption of what you think is the obvious solution, by Mr. Claussen, was complicated by what he appears to have considered the need of providing some co-active mechanism to support the blank immediately beneath, and while being operated on by the tucker, and the carriage 56 of the second column of the Defendant's Drawing No. 9 [the so-called 'carrier' of defendant's machine], have you taken into consideration the need or desirability of such a device, in assuming that the plan of recessing the cylinder was obvious?

"A. I have taken into consideration the need or desirability of such a device, in my consideration of the plan of recessing the cylinder; and I consider that the need or desirability would be attended to, as a subsequent problem in the development of this machine to its final form."

(Two parenthetic comments are suggested by the foregoing

questions and answers. First. That Mr. Claussen did not propose or indicate in any of his sketches that there was to be *any support* beneath the bag blank and opposite the creasing edge of his tucker-plate, this appearing first in the Claussen patent, 598,497, filed three months after the issue of the Liddell Patent in suit, and after its examination by Mr. Claussen; and, Second. That Mr. Claussen, in his "V-plate" patent, No. 574,020, for which application was filed July 18, 1896, and in which he developed the subject of Claussen Exhibit No. 3, and its predecessor No. 5, *actually adopted the plan of Liddell of giving bodily movement from and towards the cylinder of the tucker-plate,* of which Mr. Stone, in answer to x-Q. 250, above quoted, says: "I cannot imagine a man capable of designing the ma-"chine set forth in Claussen Exhibit No. 3, as floundering to "the extent of ignoring the first solution [recessing the cylin-"der] which appears to be obvious, and taking up the second "suggested solution [movement of the tucker-plate], with the "marked changes it would probably involve.")

[*Adjourned to Monday, November 30, 1903, at 10:30 A. M.*]

Monday, November 30, 1903.

[*Met pursuant to adjournment.*]

Present—The Notary, and Counsel as before.

[*Adjourned to 2 P. M.*]

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2 P. M.

Whether or not the recessing of the cylinder and the provision of a movable section of the cylinder periphery in the recess were originally and independently obvious, as Mr. Stone here insists, they were manifestly obvious after Liddell had shown in his patent a movement of the supporting axis of the tucker-plate.

While the testimony of Mr. Stone, last above quoted, is doubtless sufficient to justify this conclusion, I think it best

to make such conclusion even more apparent by means of a sketch and a model, which I am now having prepared. The sketch illustrates the mechanical movement involved in the abstract, so to speak, or dissociated from a paper bag machine. Calling the sketch "Dayton Sketch Optional Movements," the part 1 is shown pivoted at its upper end to a slide 2 movable within a guide 3, and having above it an expansive coiled spring 4, which, if the part 2 be left movable, tends to press the part 2 downward when the latter is lifted, but at 2a is a removable pin passing through the part 2, to lock said part in its lowermost position. Beneath the parts above described is, say, a table 5, having a recess 6, within which is fitted a vertically movable section 7, supported on springs 8 and, when in its most elevated position, as shown in the sketch, nearer to the pivot of the part 1, than the length of said part 1. 7a, 7a, are pins by which the part 7, may be held immovable in its highest position, shown in the sketch. It is a mechanical problem to move the inclined pivoted part 1, from the inclined position shown in full lines in the sketch, where its free end rests on the top of the part 7, to the position shown in dotted lines. If both parts 2 and 7 be locked in their positions shown in the sketch this cannot be done, because 1 is longer than the distance between its pivot and the part 7; but if either part, 2 or 7, be unlocked the desired movement of the part 1 is easily produced, because the unlocked part, whether 2 or 7, will then readily yield as the part 1 is swung on its pivot. And it obviously makes no difference whether the part 2 or the part 7 be released and made movable for this purpose. If the slide 2 be released by the removal of the pin 2a, movement of the part 1 on its pivot from the full-line position to the dotted-line position will be accompanied by a rise and fall of said slide 2; and if the slide 2 be left locked and the pins 7a be removed to release the part 7, then the said part 7 will move downward and upward in such swinging of the part 1 upon its pivot, which pivot is then stationary. For such swinging movement of the pivoted part 1 a relative movement from and towards each other of the parts 2 and 7 is essential, but it is not essential which of said parts

2 and 7 shall be given the *positive* or actual movement in such *relative* movement of these two parts.

"Complainant's Exhibit, Dayton Model Optional Movements" illustrates operatively what is shown graphically in the above "Dayton Sketch Optional Movements."

Both the Sketch and the Model precisely illustrate the difference between defendant's machine and the Liddell Patent, and conclusively show, in my judgment, that this difference is purely mechanical and formal and not at all a difference in principle or essence. Part 1 of the sketch, or model, may represent the tucker-plate of either defendant's machine or the Liddell Patent. Being pivoted at a point remote from its edge, and being called upon to swing on its pivot while its edge preserves a relation of contact or close proximity to a subjacent bed or cylinder, either the pivot of the plate must move away from and towards the bed, or the bed must move away from and towards the pivot of the plate. Liddell chose to illustrate in his patent actual movement of the pivot, and defendant has chosen to give actual movement to the bed. Both have the same *relative* movement of these two parts, which is the essential of the Liddell invention, and they differ only in the non-essential as to which of the two parts is made actually movable. The novel result accomplished by Liddell is the result of the relative movement between the plate pivot and the bed, and is not the result of giving the actual movement to either particular one of these parts. Consequently, the same result is obtained in defendant's machine as in the machine illustrated in the Liddell Patent, and the machines are, therefore, essentially alike in this particular.

In the sketch "Dayton Sketch Optional Movements," and in the accompanying model referred to, the vibratory member 1 presses the pivot and bed apart as said member 1 approaches the perpendicular and controls their movements towards each other (produced by the spring element) as said member passes the perpendicular. In the machines being compared the external supporting pivot of the forming-plate and the bed are moved without such spreading and controlling action of the forming-plate. In the machine of the Liddell Patent, in which

the pivot of the plate is moved, such mechanism consists of the cams K K′, arms F, and the gears, M′ M, etc., these being, when properly proportioned, perfectly adapted for that purpose and for vibrating the plate, as shown by the actual Liddell machine built under the patent and here in evidence. In defendant's machine the mechanism for vibrating the plate and for separating and proximating the pivot of the plate and the bed are necessarily divided, although connected with each other through co-ordinating gearing. The plate is rocked by one part of this mechanism and to-and-fro movement is given to the bed by another part of the mechanism. But this is merely incidental to the choice or selection of the particular part which is to be actually moved from and towards the other, as between the pivot of the plate and the bed. If the essential machine had existed before, and Liddell had merely invented the particular devices for moving and operating the forming-plate, then this difference would be essential; but as Liddell's invention is far broader than this and, in the terms of the claims in suit, calls only for the relative movement of the bed and plate pivot without restriction to particular means for giving the positive movement of one of these, as distinguished from the other, it is my understanding that this difference is not material, but is merely formal, mechanical and incidental. The claims in suit read upon defendant's machine as perfectly as they do upon the particular form of machine shown in the drawings and specification. In other words, they read broadly to the invention of which the patent drawings show one practicable form, and defendant's machine another; and, as the prior art has been found to impose no restrictions upon said claims, they, in my judgment, necessarily cover and embrace defendant's machines, notwithstanding the structural differences pointed out.

A special point having been made by Mr. Stone of the fact that a larger number of members are employed in Liddell's illustrated plan of giving the actual movement to the pivot of the tucker-plate than are employed by the defendant in giving the actual movement to the bed (as Mr. Walker unfairly shows in Figs. 3 of Defendant's Drawing, No. 8), I not only repeat

that Mr. Walker has made essential omissions of parts in Fig. 3 of the "Defendant's Machine" column of that drawing, but I point out that the number of parts shown by Liddell may be greatly reduced without any departure whatever from his invention as defined in the claims in suit, and in perfect accordance with the express provisions of his patent specification which I have frequently quoted in my depositions in the opening case. And, to show this, I now produce a blue-print entitled "Liddell Paper Bag Machine—Two Modified Forming-plate Operating Plans." Both figures or plans of this blue-print show fewer parts for oscillating the forming-plate than are shown in the Liddell Patent, and possibly fewer than are involved in defendant's construction, and from this blue-print it becomes apparent that the Liddell invention is susceptible of other modifications and simplifications than those presented in defendant's machine. The simplified modifications shown in said blue-print have, moreover, the advantage over the modification adopted in defendant's machines, that they do not involve inferiority of construction and operation, such as that which I have pointed out as present in defendant's machines as the result of placing the supporting axis of the tucker-plate nearer the creasing edge of said plate than it is shown in the Liddell Patent.

Adjourned to Tuesday, December 1, 1903, at 12 noon, at 451 Washington street.

By stipulation, the record of the session held at 451 Washington St., on Dec. 1, is inserted in the record after the completion of the answer to Q. 263. (See page 328.)

Tuesday, December 1, 1903, 3 P. M.

At 120 Broadway.

[*Met pursuant to adjournment from session at 451 Washington street.*]

Present—The Notary, and Counsel as before.

[*Mr. Dayton continues his answer to Q. 262.*]

I have at such length discussed this difference between de-

fendant's machine and that form of the Liddell invention illustrated in the Drawings of the Liddell Patent in suit because, though, in my judgment, only formal and mechanical, it is, nevertheless, so plainly observable as possibly to seem material, and because so much pains has been taken in defendant's record to emphasize the differences in the operating mechanisms incident to the transposition of actual movement from the pivot of the tucker-plate to the rotary bed. I do not find that this mere transposition has, in itself, been given special prominence in defendant's testimony, but that such prominence has been given chiefly to the incidental mechanism accompanying the transposition. This is particularly true in the showing made in Figs. 3 of the "Liddell" column and "Defendant's Machine" column of Defendant's Drawing No. 8, which I have made the occasion for the above discussion at this place. The general subject is again referred to in Question and Answer 31 (page 234, D. P. R.), in connection with Defendant's Drawing No. 9, in which Answer Mr. Stone says that he finds "no earlier "record of an inwardly and outwardly oscillating carrier, re- "volving about a fixed axis, than that disclosed in the Claus- "sen Patent No. 598,497, of February 8, 1898." It is also referred to in questions and answers 36 and 37 (pages 237-8-9, D. P. R.), in which Mr. Stone is asked, first, if the cylinder C of the Liddell Patent could be put in place of the rotating cylinder and its oscillating carriers of Defendant's machine, and operate,, and, second, whether the tucker-plates of the two machines are interchangeable, so that the Liddell tucker-plate would work with the cylinder of defendant's machine, or so that the tucker-plate E of the Liddell machine would work in defendant's Walker Model-Room Machine. The answers to these questions are triumphantly to the effect that neither the cylinders are interchangeable, nor the tucker-plates interchangeable. Assuming the answers to be correct, to my mind they prove nothing as to an essential difference between the two machines. Each is planned and designed, as to its details and the timing of the parts, with reference to the particular one of the two plans possible for swinging the tucker-plate on its supporting axis. Each of these plans involves the essential

feature of provision for relative movement between the pivot of the plate and the opposing bed or cylinder. To put the tucker-plate of defendant's machine, with its non-movable pivot, into a machine following the plan shown in the Liddell Patent, where the bed or cylinder is immovable, would produce a machine without this essential provision of relative movement of these parts. Such a machine would, of course, not be the Liddell invention and would not be operative. Moreover, it would not be defendant's machine. So that proposition is absurd on its face, and has no bearing whatever on the question of substantial identity of defendant's machine with the Liddell Patent.

The other proposition, namely, the bringing together in one machine of a tucker-plate which has its supporting pivot movable, as in the Liddell Patent, and a cylinder which has its bed sections radially movable, as in defendant's machine, is quite a different one, and Mr. Stone's reply to this question, in his answer to Q. 37, is erroneous, beyond question. In such a machine both relatively movable parts would be actually movable, and, by proper designing of the cams, both parts may be in fact movable with perfect operativeness and success. Mr. Stone's reasons for the contrary opinion are found in the last four lines of page 238 and the following first line of page 239 D. P. R. They are in these words:

> "as [because] the said folding-plate would go through its motion so far from the working surface of said oscillating carrier, as to be inoperative. Also, the forming-fingers of the Liddell forming-plate would find no means in the Walker Model-Room Machine for their operation."

As to the first of these two reasons, it is baseless, as a general proposition, because in such a machine the movement of the tucker-plate pivot and that of the bed would of course be adjusted to prevent the defining edge of the plate from going through its motion too far from the working surface of the oscillating carrier. In other words, such a degree of movement would be given to each of the relatively movable parts as to give operativeness in this particular. As to the second alleged reas-

on, that there are no means *now present* in the Walker Model-Room Machine for operating the particular fingers on the forming or tucker-plate of the Liddell Patent, I reply that of course there are not; but there could be put into the Walker Model-Room Machine, along with the Liddell tucker-plate and its forming-fingers, the same means shown in the Liddell Patent for operating those fingers, namely, the cam I of the Liddell Patent. These belong together and they should go together. The reasons given by Mr. Stone, are, therefore, dependent on the assumption that no accompanying changes whatever shall be made in making the main change supposed in the question, which is unreasonable. He might as well have given as a reason that the axial shaft *c* which carries the tucker-plate E in the Liddell Patent would not be long enough to reach, or large enough to fit, the bearings made in defendant's machine for the shaft 75 carrying the tucker-plate frame 300 and the plate 82 of the Walker Model-Room Machine. The same sort of reasoning would lead Mr. Stone to say that a four pound bag machine made under the Liddell Patent does not contain the same invention as a two pound bag machine made identically like the other, because the tucker-plate of one of these machines will not work in the other. And this is precisely the conclusion expressed by Mr. Stone after giving the above alleged reasons, in these words, beginning in line 1 of page 239 D. P. R.:

> "It is therefore to be seen, that the tucker-plate of the Walker Model-Room Machine, and the Liddell forming-plate, do not perform the same function in substantially the same way."

[*Adjourned to Wednesday, December 2, 1903, at 10:30 A. M.*]

Wednesday, December 2, 1903.

[*Met pursuant to adjournment.*]

Present—The Notary, and Counsel as before.

[*Mr. Dayton continues his Answer to Q. 262.*]

The same sort of *non sequitur*, as it seems to me, follows

Mr. Stone's consideration of the side-forming fingers shown in the Liddell Patent, as given by him in answer to Q. 38, where he says, at the bottom of page 242:

> "It will therefore be seen that the diamond side forming fingers of the Walker Model-Room Machine operating in a plane at right angles to the working surface of said tucker-plate, and operative not only to define, in a general way the folds of the bag blank, but to so clamp and hold the said bag blank as to clearly define and form said folds, are substantially different in their construction and mode of operation from the side forming-fingers of the Liddell tucker-plate operating in a plane parallel to said tucker-plate, and indicating in a general way only the folding of the bag blank thereon."

Earlier in the same answer, practically the same conclusion is expressed by Mr. Stone in comparing the side fingers on the Liddell cylinder with the side fingers on the cylinder of the defendant's machine.

Several facts are to be noted in this connection. First, both Mr. Stone and I have repeatedly pointed out that there was nothing new in either of these two forms of side folding fingers, and this fact has been urged by Mr. Stone, through the medium of drawings and text, as showing that Liddell had made no invention. And it is true that he did make no invention in this particular form of finger. Liddell's invention lies far below these or any other mere details, as I understand it and have sought to make clear. Now, however, Mr. Stone, in this answer, seeks to confine the Liddell invention to such particular details as the specific form of the side diamond-forming fingers, as well as to the particular way he shows of giving the necessary relative movement between the pivot of the tucker-plate and the rotary bed. This is plainly inconsistent, in my judgment, and there is nothing either in Liddell's attitude with respect to the prior art, or in the claims sued upon, to warrant any such effort to restrict the claims in suit to the particular form of the side diamond-forming fingers which Liddell has chosen to show in his patent. On the contrary, the generic terms of the claims

in suit, to wit: Nos. 1, 2 and 7, are shown to be intended to be unrestricted, by the fact that in some other claims of the patent, as, for example, claim 8, this specific form of diamond-forming fingers is specifically mentioned.

Secondly. It is not true, as stated by Mr. Stone, that any such distinction exists between the particular fingers G G and H H, shown in the Liddell Patent, and the fingers employed in defendant's machines as results in any material difference in clearness of definition of the triangle folds effected by the fingers referred to. The fingers of neither machine makes these triangle folds sharp and final, but the fingers of both machines define said folds and, in the same way and to the same degree, contribute to the laying of the paper in the form of a diamond containing these triangle folds, preparatory to the flattening, pasting and other operations which follow the formation of the diamond and result in the completion of the bag bottom. It seems to have been thought safe, in the absence of an actual machine built in accordance with the precise details shown in the Liddell Patent, to allege or assume any state of facts or of operation concerning such a machine, and to draw any conclusion thought necessary, from such assumption. The actual machine, "Complainant's Exhibit Operative Machine of Liddell Patent in Suit," shows the impropriety of many of these assumptions, this one among them. And the conclusion, of course, falls with the incorrect assumption upon which it is based.

In Q. 61, page 257, D. P. R., Mr. Stone was asked to compare *all* the self-opening square paper bag machines of the Continental Paper Bag Company, including the Walker Model-Room Machine and the fifty-seven other machines seen at the factory of that company, with the Liddell Patent in suit, and to give a comprehensive summing up of that comparison. In his answer to this question Mr. Stone makes no recognition whatever of the fundamental novelty which I have pointed out as the characteristic of the Liddell invention, consisting in the combination with a continuously rotating cylinder, bed or series of beds, having one or more pairs of side-forming fingers (a pair for each bed), of a tucker or forming-plate provided with one pair of side-forming fingers and supported externally

to and independently of the cylinder upon an axis remote from its creasing edge, which axis is relatively movable from and towards the surface of the cylinder, bed or beds, whereby in the operation of the machine upon tucked paper bag tubes, the said tucker or forming-plate oscillates about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder in the opening and forming of a square bottom on such a tucked bag tube, but confines himself exclusively to a recapitulation of the differences in details between defendant's machines and that of the Liddell Patent. And I do not find that either here or elsewhere in defendant's testimony there is any denial made that each and all of defendant's machines contain the fundamental and characteristic novelty of the Liddell invention as generically defined in the claims here sued upon, which claims involve such fundamental novelty as is in different terms, immediately above stated by me.

[*Defendant's counsel objects to the foregoing answer of thirteen thousand words to Q. 262 on the same grounds as those upon which that question was objected to.*]

[*Defendant's counsel also objects to the said thirteen thousand word answer, because it contains much matter assignable to no category other than opinions of questions of law, and much matter which is quite immaterial to all the issues of the suit; and because it is substantially a partisan argument in favor of the complainant's contentions on the subject of infringement, in which argument the complainant's case is idealized and beautified out of conformity to the facts which underlie it and in which argument the defendant's case is distorted and misstated to suit the complainant's contention on the question of infringement.*]

[*Defendant's counsel asks the Court to treat the argument of the witness in response to Q. 262 as a mere argument for the side employing him, and not to treat it as being evidence of anything, or as belonging to the domain of testimony.*]

[*Adjourned to Thursday, December 3, 1903, at 11 A. M.*]

Thursday, December 3, 1903.

[*Met pursuant to adjournment.*]

Present—The Notary, and Counsel as before.

[*Complainant's counsel offers in evidence the blue-print drawing produced by the witness in connection with his last answer to Q. 262, and showing in perspective the diamond-forming devices of the Walker-Model-Room Machine, etc., and the same is marked "Complainant's Exhibit Drawing Walker Model-Room Machine Perspective Views," A. B. C., Notary Public, Dec. 3, 1903.*]

[*Defendant's counsel objects to the blue-print, because it is out of conformity with the Walker Model-Room Machine in the following respects:*]

[*Fig. 3 of the blue-print represents the side fingers 67 and the side fingers 62 and the double front clip 61 and the rear hook 82b as folding a complete diamond; whereas in the Walker Model-Room Machine those instrumentalities do not and cannot fold a complete diamond, the diamond being completed in that machine by a roller not shown in the blue-print, and being thus completed after the fingers 62 have passed entirely out of action and out of contact with the paper.*]

[*Defendant's counsel also objects to the blue-print, because its origin has not been proved, and because, whatever that origin may have been, it is certain that the blue-print was not made from a drawing which was made in the presence of the Walker Model-Room Machine. Quite otherwise than this the defendant's counsel is informed and believes that the drawing from which the blue-print was made was itself made more than a hundred miles away from the Walker Model-Room Machine.*]

[*Complainant's counsel offers in evidence the drawing on linen, produced by the witness in connection with his answer to Q. 262, and referred to by him therein as "Dayton Sketch Optional Movements," and the same is marked "Complainant's Exhibit Dayton Sketch Optional Movements," A. B. C., Notary Public, Dec. 3, 1903.*]

[*Objected to as immaterial.*]

[Complainant's counsel offers in evidence the blue-print produced by the witness in connection with his answer to Q. 262, and referred to therein as "Liddell Paper Bag Machine, Two Modified Forming-plate Operating Plans," and the same is marked "Complainant's Exhibit Liddell Paper Bag Machine, Two Modified Forming-Plate Operating Plans," A. B. C., Notary Public, Dec. 3, 1903.]

[Defendant's counsel objects to the last mentioned blue-print as not proper on rebuttal, though it would have been admissible in connection with the testimony relevant thereto if that testimony had been taken and the blue-print had been offered as a part of the complainant's evidence in chief.]

[Complainant's counsel offers in evidence the model referred to by the witness and produced in connection with his answer to Q. 262, and called by him "Dayton Model Optional Movements," and the same is marked "Complainant's Exhibit Dayton Model Optional Movements," A. B. C., Notary Public, Dec. 3, 1903.]

[Defendant's counsel objects to the last mentioned model as not proper on rebuttal, though it would have been admissible in connection with the testimony relevant thereto if that testimony had been taken and the model had been offered as a part of the complainant's evidence in chief.]

Q. 263. Referring to your answer to Q. 249, you have therein mentioned and described a certain illustrated drawing which you specifically refer to as follows:

> " I will have a drawing prepared showing the cylinder with its various clips and fingers in conjunction with the pasting and creasing roll above referred to, illustrating the matters so far described, in side view clearly to the Court."

You also later, in the same answer, in speaking of the cams K and K′ of Complainant's Exhibit Operative Machine of Liddell Patent in Suit, say, with reference to a drawing you were then using in connection with the answer:

> "I use it here because I have no other drawing which illustrates the part about which I am speaking, but I pro-

pose to have an additional drawing made to show these cams precisely as they are present in the Liddell Machine."

Please now produce the drawings, or blue-prints referred to as above, in connection with said answer No. 249, in order that they may be marked in evidence herein, and state, in this connection, whether or not they conform to and illustrate the testimony you gave about these matters in that answer, and how it happens they are now produced, instead of at the time you testified concerning them?

A. I now produce the drawings referred to in the question, the same being in the form of blue-prints, and state that they are the drawings contemplated in the statements quoted in the present interrogatory from my answer to Q. 249, and that they conform to and illustrate the testimony I gave about the matters with which they were associated in that answer. Said drawings are now produced, instead of having been produced at that time, because they were not then made, but have since been prepared in accordance with my instructions. The titles of the several drawings and the inscriptions belonging to the several figures thereof, taken in connection with the lettering of the parts, which is in accordance with the lettering of the drawings of the Liddell Patent in suit, fully explain, I believe, the said drawings.

[*Complainant's counsel offers in evidence the two drawings in the form of blue-prints produced by the witness in his answer to Q. 263, as above, and the same are marked in evidence respectively, as "Complainant's Exhibit Liddell Paper Bag Machine Cams K and K[1]," A. B. C., Notary Public, Dec. 3, 1903, "Complainant's Exhibit Liddell Paper Bag Machine, Cams K and K[1]," A. B. C., Notary Public, Dec. 3, 1903, and "Complainant's Exhibit Liddell Paper Bag Machine Cylinder and Paster-Roll," A. B. C., Notary Public, Dec. 3, 1903.*]

[*Defendant's counsel objects to the last mentioned blue-prints as not proper on rebuttal, though they might have been admissible in connection with the testimony relevant thereto if that testimony had been taken and the blue-prints had been offered as a part of the complainant's evidence in chief.*]

[*Defendant's counsel also objects to the two last mentioned*

blue-prints, because they purport to refer to "Complainant's Exhibit Operative Machine of Liddell Patent in Suit," and because that machine is substantially out of conformity with that patent.]

Tuesday, December 1, 1903, 12 M.
At 451 Washington Street.

[*Met pursuant to adjournment.*]

Present—The Notary; SAMUEL R. BETTS, Esq., of Counsel for Complainant; ALBERT H. WALKER, Counsel for Defendant; the witness, Mr. M. E. DAYTON; also Mr. W. A. LORENZ, and Mr. JOSEPH MERRITT.

[*Complainant's counsel desires it noted that this hearing is being held in the presence of the machine marked "Complainant's Exhibit Operative Machine of Liddell Patent in Suit," in this case. Complainant's counsel desires it noted that this machine has been operated for a few minutes in the presence of counsel and expert, and in the same condition as it was operated at the hearing held in presence of the machine on November 16, 1903.*]

[*Complainant's counsel now desires the Notary to mark, with a proper tag, the portion of this machine, "Complainant's Exhibit Operative Machine of Liddell Patent in Suit," which comprises the flattening-plate thereof in order that said plate may be particularly identified as part of the exhibit, when removed from said machine, as it will forthwith be removed in presence of counsel.*]

[*Said flattening-plate is accordingly marked "Complainant's Exhibit Flattening-Plate A of Operative Machine of Liddell Patent in Suit."*]

[*Complainant's counsel now directs the removal of said flattening-plate A from the machine, and the substitution therefor, on said machine, of another flattening-plate, which he now requests the notary to mark "Complainant's Exhibit Flattening-Plate B of Operative Machine of Liddell Patent in Suit."*]

[*The plate is so marked.*]

[*Complainant's counsel requests the notary to note that the flattening-plate B has now been adjusted upon the machine, in place of the flattening-plate A, without any other change.*]

[*The notary so notes.*]

Q. 263*a*. Mr. Dayton, please examine the machine, "Complaintiff's Exhibit Operative Machine of Liddell Patent in Suit," and the flattening-plate now thereon, marked as "Complainant's Exhibit Flattening-Plate B of Operative Machine of Liddell Patent in Suit." The machine will now be operated in your presence and that of counsel, on a run of one thousand paper bags; and please be prepared to testify as to any incidents of that operation, and particularly as to the construction and operation of the flattening-plate B, now on the machine.

A. I will do so.

[*Defendant's counsel agrees and stipulates that the machine, with the flattening-plate B, has been run in his presence, in the manufacture of one thousand bags, and that those bags appear to be substantially equal, in percentage of merchantable bags, and in quality of bags, to those which were made on November 16, when the flattening-plate A was in the machine.*]

[*Complainant's counsel accepts the above stipulation, and, in view thereof, does not physically offer in evidence the bags produced on this run referred to, with the Exhibit Flattening-Plate B, but requests the notary to mark for identification, in view of possible future necessity, the outside bag of the last hundred of the run referred to, which hundred are tied together, so that said hundred bags can be identified by the notary in future, if it may become necessary.*]

[*The last hundred of said bags are tied together, and the last one of said bags is marked "Last 100 Made with Flattening-Plate B, Dec. 1, 1903. A. B. C., Notary Public."*]

[*Complainant's counsel now formally offers in evidence the flattening-plate heretofore marked as "Complainant's Exhibit Flattening-Plate B" by the notary, and used on the machine "Complainant's Exhibit Operative Machine of Liddell Patent in Suit," on the run just made, and the same is marked in evidence "Complainant's Exhibit Flattening-Plate B of Operative*

Machine of Liddell Patent in Suit," and in connection with that machine.]

[*Defendant's counsel objects to the foregoing offer, because, though the flattening-plate B appears to be nearly identical with a certain flattening-plate shown in the Lorenz & Honiss Patent, No. 361,951,* of April *26, 1887, that flattening-plate has a substantially different mode of operation in the so-called Liddell machine, from what it had in the machine of said patent 361,951, and because the flattening-plate of said patent, 361,951, though it has now and very lately been combined with other parts of the so-called Liddell machine, is incapable of combination with a machine constructed in accordance with the specifications and directions of the Liddell Patent in suit,—for reasons which defendant's counsel is willing to state on the record, if complainant's counsel so desires, but which reasons may be left for exposition in expert testimony hereafter.*]

[*Complainant's counsel does not in any way assent to the above statements of fact and of expert testimony on the part of defendant's counsel, but suggests that, if he proposes to give any reasons on the record, they should now be given, as there is no opportunity open to the defendant to take expert testimony, as is suggested by defendant's counsel.*]

[*Defendant's counsel replies that he expects hereafter to take expert testimony in sur-rebuttal on this point, as well as on other matters connected with the rebutting testimony of the complainant; but in order to give complainant's counsel the ground defendant's counsel will take upon this point, defendant's counsel states that the flattening-plate B has a different mode of operation in the so-called Liddell Machine, from that which it had in the Lorenz & Honiss Patent, 361,951; because in the so-called Liddell Machine, the folding-bed travels forward under the flattening-plate, while the flattening-plate is not traveling forward which mode of operation is unknown to the Lorens & Honiss Patent, 361,951; and defendant's counsel states that the flattening-plate B is incapable of combination with the machines of the Liddell Patent, because in that machine the final position of the tucker-plate E is not near enough to a tangent to the cylinder C to enable the flattening-*

plate B to work on the cylinder C and tucker-plate E at the same time, whereas, in the so-called Liddell Machine, the tucker-plate takes a final position almost exactly tangential to the cylinder C, with the result of enabling the flattening-plate B to operate upon the tucker-plate and the cylinder at the same time.]

[*Defendant's counsel requests the complainant's counsel to authorize and direct one of its experts to remove the flattening-plate B from the so-called Liddell Machine, and to run that machine without that flattening-plate or any flattening-plate thereon, in an attempt to manufacture a hundred bags or a thousand bags, as the case may be, and to carefully count and preserve those bags and put them in evidence, so that the Court may know what the so-called Liddell Machine will do without any flattening-plate above the diamond blank.*]

[*Complainant's counsel wishes it understood that he does not assent to the statements of fact or expert evidence above made on the record by defendant's counsel, and particularly that he does not in any way assent to the proposition that defendant has the right or will be allowed to take surrebuttal evidence. In regard to the request of defendant's counsel to run the said Liddell machine without any flattening-plate, defendant's counsel, in view of his information on the subject, characterizes it as an unheard of and ridiculous request in connection with the mechanism or operation of paper bag machines. Having put on the Liddell Machine a flattening-plate taken directly from the old art, as will be shown directly by complainant's expert, he has hoped to satisfy defendant's counsel. If any further operation of the Liddell machine shall be made, defendant's counsel will have due notice thereof, with a request to be present, in order that a record may be made.*]

[*Adjourned to 3 P. M. at 120 Broadway.*]

Q. 264. Referring to Complainant's Exhibit Operative Machine of Liddell Patent in Suit as run in your presence, and in that of counsel and others, on November 16, with the flattening-plate thereon which has been marked "Complainant's Exhibit

Flattening-Plate A," etc., and again on December 1, with the flattening-plate marked, "Complainant's Exhibit Flattening-Plate B," etc., please compare the run of December 1, with that of November 16, as to operation and results, particularly in respect to said flattening-plates A and B. State also briefly the object and functions of flattening-plates and similar devices generally in paper bag machines. State also whether you find said flattening-plates A and B referred to, or either of them, in the art prior to date of filing application for Liddell Patent in suit, and if so where, and make a comparison between any such plate of the prior art and the plates A and B used on that Liddell machine, as to construction and operation.

Refer also to the art, prior to Liddell's application, in respect to flattening-plates and similar devices on paper bag machines, and state what you find it to be, and also whether it discloses, or whether you have knowledge of, prior to the Liddell Patent, or since, any paper bag machine for making bags from a tucked tube, which makes a finished bag without a flattening-plate or flattening device of some kind?

Defendant's counsel objects to Q. 264 on the following grounds:

First. The proposed comparison between the flattening-plate A and the flattening-plate B is superfluous, because the defendant's counsel has already admitted on the record that the work done by those two flattening-plates on November 16 and December 1 was substantially the same in merit.

Second. The request for an account of the objects and functions of flattening-plates and similar devices generally in paper bag machines, calls for a long and immaterial statement of matters not involved in this litigation.

Third. The question whether the flattening-plates A and B, or either of them, are to be found in the art prior to the Liddell patent in suit is immaterial, in view of the fact that no flattening-plate is found in that patent.

Fourth. The request to ransack the prior art and ascertain whether it contains any paper bag machine for making finished

bags from a tucked tube without a flattening-plate is immaterial, because the Liddell Patent in suit does not purport to make a finished bag anyhow, but only to make a diamond fold as one step toward the production of a finished bag.

Fifth. It being undeniable that the mechanism of the Liddell Patent in suit cannot make the diamond fold which it purports to make without the addition of a flattening-plate thereto, as well as other changes therein, it is immaterial whether the flattening-plate needed to be added thereto and combined therewith can be found in other combinations in some patent prior to that of Liddell.

Sixth. The Question 264 apparently calls for another long partisan argument on mixed questions of law and fact, and which kind of argument is not proper to be inserted in the deposition, however suitable it might be for insertion in the brief of counsel, or however suitable or unsuitable it might be as an exposition of the subject.

A. The machine "Complainant's Exhibit Operative Machine of Liddell Patent in Suit" was run on December 1 with the flattening-plate B substituted for the flattening-plate A, previously present in the machine, at the same speed of a little more than 130 bags per minute, as on November 16, and with the result, admitted in the first paragraph of objection of defendant's counsel, last above made, of making as good bags as were made on November 16.

The primary object and function of a flattening-plate in paper bag machines is indicated by its name. That is to say, such a plate is for the purpose of flattening the folds of the diamond which are always and necessarily loosely made by the diamond forming devices, so that, unless the paper is broken along the diamond fold lines, or unless the paper is held down in the position it is given by the diamond-forming devices, it will tend to spring up, by its own resiliency, and will assume an improper position for the succeeding operations of applying the paste and folding the flaps. The flattening-plate joins with its flattening function that of holding the paper down while it is passing onward to such pasting and flap-folding operations,

because the flattening which it effects is not so complete as to make the fold lines of the diamond perfectly sharp, or to break the paper down so completely, as one may do under a paper knife, as to absolutely and perfectly retain the paper in the proper or best position for it to be subjected to the pasting and flap-folding mechanisms. Flattening-plates in different machines may vary and the flattening-plate of any given machine may be made to vary, with respect to the extent of its breaking-down action and as to the extent of its mere holding-down action, according to the necessities of the machine with respect to the proximity or remoteness of the flap-pasting and folding devices, and such variation in any individual plate may, of course, be effected by its adjustment.

All machines for commercially making finished paper bags from tucked tubes have flattening-plates or other flattening devices, and, for the reason above given, to wit: that no diamond-forming mechanism is such machines pretends to so sharpen and permanently form the fold lines of the diamond as to make the flattening-plate or other flattening device unnecessary. And the diamond-forming devices are not any the less diamond-forming devices because the subsequent use of the flattening-plate or device is called for. Such diamond-forming devices consist of fingers which may or may not clamp the paper at the points where they act thereon, but which are always at a distance from each other and cannot act upon the paper which is between them. How impossible it is for them to break down the folds between them becomes evident to anybody who will take a sheet of paper, such as paper bags are made from, or any other kind, and bend over the corner of that paper by pressure only at the extremities of the bend. And the line of flexure in this hand experiment may be made either one inch or six inches long with the same result, that the paper immediately springs up after being released from the fingers bearing upon the extremities of the line of flexure, because the paper is not bent sharply, or broken down along the intermediate portion of such line of flexure. In forming the diamond on a tucked paper tube the case is not so favorable to the retention of the paper in the form in which it is turned over, as in this hand experiment, be-

cause there is no external pressure upon the overturned fold at the extremities thereof. The long side flaps of the diamond are exterior to the fingers by which they are formed, and the fold lines are not compressed at their extremities, or at any other point in their length. This is shown clearly in the "Complainant's Exhibit Drawing Liddell Machine Parts Opening Diamond," and in "Complainant's Exhibit Drawing Walker Model-Room Machine Perspective Views," where it will be seen at a glance that all the fingers in action are beneath all the folds of the top plies of the diamond, and that all said folds of the top ply of the diamond are shown rounded, instead of sharply flattened. Only the side fingers bear upon the top ply of any fold entering into the diamond, and these only at the extremities of the interior upper folds of the side triangles. It is, therefore, perfectly obvious that, after the diamond has been completed by the diamond-forming devices, as shown in Fig. 4 of "Complainant's Exhibit Drawing Liddell Machine Parts Opening Diamond," and as also shown in Fig. 2 of "Complainant's Exhibit Drawing Walker Model-Room Machine, Perspective Views," it is necessary that the paper shall be either more sharply broken down at the rounded fold lines, or that the paper shall be held down in the position given it by the diamond folding devices, until it passes to the pasting and cross-creasing devices of the flap-folding mechanism by which the square bottom is to be completed. After the flaps are folded and pasted the bag then passes through a carrier mechanism between rolls, or between belts and rolls, which finally compress all the folds sharply, as they appear in any of the completed bags forming exhibits in this case.

Accordingly, I find not only that flattening-plates or other flattening devices are actually present in all the several kinds of practical machines which I have seen in the operation of making finished bags from tucked paper tubes, with the formation of a diamond as a step in the process, but I find such flattening devices shown in a number of patents. They are, however, not shown in all the patents the actual machines of which would require them. Except where they are to be made of novel construction or are mounted and operated in a novel man-

ner, they seem to be taken for granted very commonly, and are not the subjects of illustration or description. This happens to be the case in the Liddell patent in suit, where, nevertheless, it should be presumed to follow the action of the diamond-forming devices as much as the pasting, flap-creasing and flap-folding mechanisms, none of which are fully shown and described. Such a flattening-plate is manifestly no part of the diamond-forming mechanism, which is fully shown and described in said Liddell Patent, and to which the invention of said patent is expressly confined. The diamond-forming mechanism has completed its work, and the diamond is completed, as such, at the stage of bag manufacture shown in Fig. 4 of "Complainant's Exhibit Drawing Liddell Machine Parts Opening Diamond." What is to be further done in the completion of the bag is the transfer of the diamond thus completed to the pasting, flap-creasing and flap-folding mechanisms, with all which this patent does not concern itself, and this involves the retention of the paper in the form given it by the diamond-forming devices, which requires a flattening-plate or some other suitable device for the purpose.

[*Adjourned to Friday, December 4, 1903, at 10:30 A. M.*]

Friday, December 4, 1903, 10.30 A. M.

[*Met pursuant to adjournment.*]

Present—The Notary, and Counsel as before.

[*Mr. Dayton continues his answer to Q. 264.*]

In accordance with this recognized requirement and universal practice, the embodiment of the Liddell Diamond-forming invention in a complete machine for making finished, self-opening, square-bottom bags, a suitable flattening device has been employed in said complete machine, "Complainant's Exhibit Operative Machine of Liddell Patent in Suit." The old machine into which the Liddell diamond-forming invention has thus been introduced to make this exhibit had a flattening-plate of the kind known specifically as a "drop-plate," or in other

words, a plate which descended flat-wise upon the diamond after the formation of the latter and which, to this end, was mounted on the end of a vertically vibratory arm. I have here the old plate which was taken out of the original machine to give place to the new one, and if I have occasion to refer hereafter to said old plate I will call it briefly "Old Plate of Machine No. 88" (88 being the number of said old machine). It will be remembered that said old machine has been described as one of a large number of machines made under the Lorenz & Honiss Patent, No. 361,951, and I direct attention to Figs. 24 and 25 of said Lorenz & Honiss patent, 361,951, as showing the flattening-plate, or drop-plate, at 226, at the left-hand end of these figures. By comparing the plate 226 of these patent drawings with the "Old Plate of Machine No. 88," it will be seen that, in actual practice, the plate was modified slightly in form, but it was retained in the same position, and was operated in the same way, in practice, as shown in the patent. I am able to speak from personal knowledge of this fact from having seen machines of this character in operation, though I am unable to identify this particular "Old Plate of Machine No. 88" because I did not personally see it taken off the old machine, and am only assured of that fact by Mr. William A. Lorenz, who equipped said machine with the Liddell Diamond-forming mechanism. I point to this difference between the old plate and the patent drawings as illustrating a common practice in building machines under patents, and as showing that the formal differences between the old plate and the patent illustrations thereof does not affect the essential identity of the two.

Now, speaking more particularly of the same plate, as applied to the "Complainant's Exhibit Operative Machine of Liddell Patent in Suit," the plate as there used was also slightly modified in form. The form given it in said Liddell machine is shown in Figs. 1 and 2 in the blue-print which I now produce, and which is marked "Flattening-Plates of Liddell Paper Bag Machine." These Figs. 1 and 2 are, respectively, a top or plan view and a side view of said plate, now especially marked in this case "Flattening-Plate A," etc. In Fig. 2 of the blue-print the rotary cylinder C, with its end-clip *c*, and the forming-plate or

tucker-plate E, are also shown in connection with the flattening-plate in its lowermost position, where it remains while the bag blank having the diamond form thereon is drawn to the right beneath the plate and to the pasting and creasing roll or segment (not shown in this drawing, but seen in Complainant's Exhibit Liddell Paper Bag Machine Cylinder and Paster Roll"), by which pasting and creasing mechanism the diamond folds are confirmed.

It will be seen that the plate A was bent up at its front end so as not to encounter the finger E′ on the forming-plate, and down at its rear end or tails to conform somewhat with the cylindric shape of the bed and to approach the bed or cylinder more closely, and thereby break down the side folds of the diamond passing under the tails of the plate more completely. Plate A is seen in Fig. 2 to be mounted and to move in substantially the same way as shown in Fig. 25 of the Lorenz & Honiss Patent, No. 361,951, and the bends in the plate are obviously only such as a judicious mechanic would give it in adapting it to the particular situation presented by the Liddell cylinder and forming-plate.

But in view of Mr. Walker's strenuous objection that the plate did not conform with any flattening-plate in the prior art, the plate known as "Complainant's Exhibit Flattening-Plate B," etc., was made and used in the operation of the machine witnessed by Mr. Walker and others (including myself) on December 1, instant. This flattening-plate B is shown in Figs. 3 and 4 of said blue-print, marked "Flattening-Plates of Liddell Paper Bag Machine," and it was admitted by Mr. Walker to be made in substantial accordance with the drawing Figs. 24 and 25, of the Lorenz & Honiss Patent, No. 361,951. This flattening-plate B is made straight throughout its length, except at its front end, which is curved upwardly, as also shown in the drawings of said Lorenz & Honiss Patent. The upward curve at the front end was made a little sharper than in the patent drawing, in order that it might clear the finger E′ on the forming-plate E, as shown to be necessary in Fig. 4. Fully an inch of this upturned front end of the plate is altogether unnecessary, but it was retained to give indisputable identity with the plate 226

of said Lorenz & Honiss Patent, the plate B, in the exact form of Figs. 3 and 4 of the blue-print "Flattening-Plates of Liddell Paper Bag Machine," was found, and was acknowledged by Mr. Walker on the record, to work as satisfactorily as plate A, and Mr. Walker, therefore, confined his objection, as to the plate, principally to the use of any flattening-plate at all in connection with the Liddell invention. He further objected to plate B on the allegation that the flattening-plate of the Lorenz & Honiss Patent, No. 361,951, "has a substantially different "mode of operation in the so-called Liddell machine, from what "it has in the machine of said patent, 361,951, and because the "flattening-plate of said patent, 361,951, though * * * * "combined with other parts of the so-called Liddell Machine is "incapable of combination with a machine constructed in ac- "cordance with the specifications and directions of the Liddell "Patent in suit." Mr. Walker gives as a reason for the last objection that "in the so-called Liddell machine, the folding "bed travels forward under the flattening-plate, while the flat- "tening-plate is not traveling forward, which mode of oper- "ation is unknown to the Lorenz & Honiss Patent, 361,951."

Referring first to the objection based on an alleged different mode of operation in the patent 361,951, and in the Liddell machine, this is not correct so far as relates to the operation of flattening or holding flat the diamond in the Liddell machine. If it be true that there is a difference, such difference consists solely in the fact that in the Lorenz & Honiss Patent, 361,951, the plate takes part in *laying* the rear flap of the diamond before it arrives at its function of flattening the diamond or holding it flat, which is its sole function in the Liddell machine. Such assumed difference, therefore, is only that the plate used in the machine of Patent 361,951 does something which it does not do in the machine of the Liddell Patent, and not that it does anything in the Liddell machine which it does not do in the patent from which it is taken. And, in my judgment, such difference, if it actually exists, in nowise discredits the plate when used in the Liddell Patent as a derivative from the prior art.

As to the reason given by Mr. Walker for his last above men-

tioned objection, to the effect that the folding bed travels forward under the flattening-plate in the Liddell machine, and does not so travel in the Lorenz & Honiss Patent, 361,951, this is an error. The folding bed does travel under the flattening-plate in said patent. The folding bed of the Lorenz & Honiss patent referred to is a reciprocating bed, and does not continue to move forward, but it nevertheless does move forward under the flattening-plate and, what is more to the point, the diamond-formed blank continues to move forward under said plate. And it is the continued forward movement of the blank under the plate which is the real question, and it is quite immaterial whether the bed continues to move forward or not. There is, therefore, no difference in the mode of operation on the part of the flattening-plate in the two machines on this account.

The further objection made by Mr. Walker to the flattening-plate B, to the effect briefly, that in the "Complainant's Exhibit Operative Machine of the Liddell Patent in Suit" the tucker-plate E is carried, in its forward movement more nearly to a tangential relation to the surface of the cylinder than it is shown to be carried in the Liddell Patent, and that the plate B is, therefore, enabled to act in the actual machine where it would not be capable of acting if the tucker-plate were carried no further forward than shown in the Liddell Patent, is really a question (already threshed out) as to whether, first, the Liddell Patent means to show the position of the forming-plate E, indicated in dotted lines in Fig. 1, as its most extreme advanced position, and, second, whether the actual machine is any less the machine of the Liddell Patent because the forming plate is advanced further than shown by such dotted lines of Fig. 1. There is nothing in the Liddell Patent declaring such dotted lines of Fig. 1 to be the final advanced position of the forming-plate, and nothing in the structure requiring that to be the limit of said plate, and, in my judgment, it is open to the constructor to move the plate further forward than the position indicated by said dotted lines, if, for any reason, he choses to do so. But, assuming the forming-plate to be moved less far forward than it is moved in the actual Liddell machine, and even no farther forward than shown by such dotted lines of Fig. 1 of

the Liddell Patent, and assuming further that a perfectly flat flattening-plate would not properly flatten or hold flat the diamond drawn from the the forming-plate in this less advanced position, it is my opinion that the bending of the flattening-plate to enable it to properly act upon the diamond in that case would not make it an essentially different plate from that of the Lorenz & Honiss Patent, No. 361,951, but would be merely a mechanical adjustment of that plate to the particular situation.

I find nothing in the text of the Lorenz & Honiss Patent, 361,951, concerning the flattening-plate 226, except what is contained in the 18 line paragraph, beginning with line 88, on page 4, and here nothing whatever is said as to its function or functions, but only as to its position, mode of mounting, vibratory motion, and its general construction. Of the form of the plate the specification says only that it "has two extensions reaching to both "sides of the upper gripper-rollers, 175 and 176, and over the "lower gripper-rollers, 177 and 178." Such brief reference to the plate 226 naturally suggests that, in its general character, it was old at that time. And so I find it to have been. For example, I find in the Leinbach, Wolle & Brunner patent, No. 242,661, of June 7, 1881, the first machine ever invented for making a Decring bag. In this machine, as well shown in the numerous figures on sheet 1 of the drawing, the diamond is extended by means of angular folding-plates, seen at *f* in Figs. 5, 6 and 7, co-operating with a horizontal creasing plate B and a distending rod G which, being arranged in a horizontal position and having a lengthwise reciprocating motion, enter the mouth of the bag blank, and while holding down the middle point of the front flap, throws downward and backward the rear flap at the same time that the expanding triangle fingers *f* unfold and form the triangle over the edge of the plate B. The diamond being spread completely, as shown in Fig. 7, the rod D is retracted at the same time that the diamond advances beneath it, and the rod being retained in position over the diamond serves to hold the latter extended as it proceeds to the pasting and flap-folding mechanism. A later Leinbach,

Wolle & Brunner Patent, No. 327,280, of September 29, 1885, employs a drop-plate, or, rather, two drop-plates acting as one, as shown in p' p' in Figs. 14 and 16 of Sheet 4. The double drop-plate p' is mounted on a yoke frame p^2 constituting a pivoted arm substantially like that of the Lorenz & Honiss Patent, No. 361,951, and like that of "Complainant's Exhibit Operative Machine of the Liddell Patent in Suit." The expanded diamond is shown in Fig. 13, and is assumed to be present in Fig. 14 under the uplifted drop-plate. In Figs. 15 and 16 the drop-plate is down and in the act of holding the diamond (the folds of which it has flattened) in its further progress towards the pasting and flap-folding mechanisms. The specification states at page 2, lines 42 to 71, how the diamond is formed, and then adds, at page 2, line 72:

> "After the fold has been formed it is further flattened by the action of the presser plates P', similar to those described in our patent, No. 242,661, and shown in Fig. 16 [of this patent]. In this Figure [16 of the present patent] the presser rod p and the means for operating the same have been omitted in order not to confuse the representation of the flattening-plates p'."

It will be observed that this double flattening-plate p' of the second Leinbach, Wolle & Brunner Patent has no other function whatever than that of flattening and holding flat the diamond, wholly formed by other means, but yet having its fold lines rounded or unbroken or unsharpened, and, therefore, unadapted to retain the form of the paper in its passage to the flap-creasing and pasting devices. It will also be observed that the flattening-plate A or the flattening-plate B of the "Complainant's Exhibit Operative Machine of the Liddell Patent in Suit" might be completely divided lengthwise, as it is now partially divided, and that it would, in that case, act precisely as it does now for exactly the same purpose or function of the centrally and longitudinally divided drop-plate of the Leinbach, Wolle & Brunner Patent, 337,280.

Very commonly drop-plates, made in two longitudinally divided parts, were severally hinged at their outer edges so as

to fold downward upon the sides of a preliminary box formation of the end of the blank to throw the sides of the box down and expand the end flaps of the diamond, being in this respect wholly dissimilar to the double drop-plate of the Leinbach, Wolle & Brunner Patent 337,280, in which both parts of the drop-plate maintain the same plane with each other and have no function in folding the diamond. An instance of this hinged construction is shown in the Lorenz & Honiss Patent, No. 331,722, in which the plates are marked 160 and 161, and are seen in Figs. 19, 20, 23, 32, 33 and 34—perhaps best in 33 and 34, taken together. Their function in expanding the diamond in this case is set forth at line 67 to 74 of page 4 of the specification, which reads as follows:

> "The carriage then travels farther along, and when it arrives between the two side-folder plates 160 and 161, which are shown in dotted lines in Fig. 24, these plates are swung downward, which flattens the box 170 into the diamond 8, as seen in Fig. 25, Sheet 6, and the pressure of the presser-plate 154 is released at the same time."

[*Adjourned to Saturday, December 5, 1903, at 10:30 A. M.*]

Saturday, December 5, 1903, 10.30 A. M.

[*Met pursuant to adjournment.*]

Present—The Notary, and Counsel as before.

[*Mr. Dayton continues his answer to Q. 264.*]

In the commercial machines of the Stillwell type divided and hinged flattening-plates are also employed, but in these machines they have the sole function of flattening and retaining the paper in the diamond form while it passes on to the pasting and flap-folding mechanisms. The Stilwell patent No. 407,794, which is the first to show the Stilwell machine, shows these flattening plates at U U, Figs. 17, 19, 20, 28 (here detached),

29, 30, 31 and 32, and the specification says of them, at page 7, line 90:

> "The side or wing folder-plates U U are simple and convenient devices *for holding the diamond in shape as it passes to the pressing and pasting rolls* N N'. They are not, however, essential, as their place could be to a certain extent at least, supplied by stationary guides."

The Lorenz and Claussen patent No. 410,841, also shows hinged flattening-plates which in this case are concerned in first completing the diamond form and then in holding it in form during its forward movement, the paper having been first opened out into the box form, shown in Figs. 5 and 6 of the patent drawings. The flattening-plates, which are in this case also folding-plates, are seen at 10 and 11 in Figs. 17 and 18, sheet 1, and in Figs. 12 and 13, sheets 3 and 4.

Similar folding and flattening plates to those last mentioned are also shown and described in the Lorenz and Honiss patent, No. 410,842, being the plates 50 and 51 of Figs. 1 and 3.

The Claussen and Mortson patent shows and describes a single flattening plate as a "drop plate," the same being seen at 181 at the top of Fig. 11 and at 181 at the top of Fig. 33. In this case the end of the bag blank is opened out first into a box form and the box is transformed into the diamond partly by action of the plate 181 and partly by other means, the plate however performing, finally, the function of flattening the diamond folds and holding the paper in the diamond form in its passage forwardly to the bottom-completing devices.

The foregoing are instances of patents which for one reason or another describe the flattening devices. All these patents, it will be observed, illustrate complete machines for fully finishing the bag bottom. In some of them the flattening plates are shown as parts of the complete bag making machine, as distinguished from parts of the diamond-forming mechanism, and in some as part of the diamond-forming mechanism. I now produce a patent, to wit, 337,965, to Lorenz & Honiss, which shows only diamond-forming mechanisms. In this patent no flattening devices are shown, but, in the complete machine,

which includes devices for finishing the bag bottom, a flattening device was employed, as I am informed by Mr. Lorenz, one of the patentees. The flattening device in this case consisted of rollers and belts arranged to take the bag blank from the diamond-forming mechanism, separately shown in Figs. 9 and 10 of sheet 4. The fully formed but unflattened diamond, while still held at its rear flap by the fingers 96, seen in Figs. 7, 8, 9 and 10 is drawn between the flattening devices situated at the right of Figs. 9 and 10, and is thus flattened as it proceeds from the diamond-forming devices, then in the position shown in Fig. 10.

Such flattening devices are omitted from the illustration of this Lorenz & Honiss patent, No. 337,965, for the same reason, probably, that they are omitted from the drawings of the Liddell Patent in suit, namely, that the patent does not purport to show anything specifically beyond the mechanisms for opening out the end of the bag blank into the diamond form. Everything else requisite to the completion of the bag bottom is outside the actual invention described and claimed. And such additional requisites for finishing the bag are taken for granted and are subject to selection from the prior art or to independent invention, as the builder of the machine may elect.

Mr. Walker has intimated, as I understand him, that the sharp lines employed in the Liddell Patent in Suit, and particularly in Fig. 8, indicate that Liddell intended to reperesent the diamond as having its fold lines completely flattened so that no flattening-plate or other flattening device would be necessary. But this is a wholly unwarranted conclusion. Such sharp lines are merely the conventional resort of the draughtsman, and they are employed in Fig. 10 of the Lorenz & Honiss patent No. 337,965, and in various other patents, in the same conventional way, where no sharp fold is actually present. And I point to Fig. 7 of the Liddell Patent as a complete refutation of Mr. Walker's inference, the condition of the bag blank in said Liddell Fig. 7 being such that no sharp angles can be present therein, although sharp lines are employed conventionally here as in Fig. 8.

In conclusion, it is my opinion that the Liddell Patent in

suit does not imply, as it does not allege, that the diamond is flattened by the diamond-forming mechanism so that no flattening-plate or other flattening device need be used in retaining the paper in the diamond-form while passing to the bottom-completing devices which may be selected or contrived to follow such diamond-forming mechanisms of the patent, in a machine for completing the bags. And in my judgment also the flattening-plate A of "Complainant's Exhibit Operative Machine of Liddell Patent in Suit," or the flattening-plate B, applied to that Exhibit Machine, is altogether warranted in putting the Liddell invention into a complete, bag finishing machine, and the employment of either of these plates, or of any other diamond flattening device in connection with the Liddell invention for a diamond-forming mechanism, in no way impugns said Liddell invention as a complete and operative invention for its particular purpose of forming the diamond on a tucked paper tube.

[*Recess.*]

[*Defendant's counsel objects to the foregoing answer of more than 5,000 words to Q. 264, on the same grounds as those upon which the objection to that question was based. And also because the answer contains statements based on hearsay, and other statements based upon illogical inference, and other statements involving propositions of law, miscellaneously mixed with statements relevant to what the witness thinks he can detect in the drawings of certain old patents; so that the whole constitutes a partisan argument in favor of the complainant, and does not conform to the law of evidence.*

[*Complainant's counsel offers in evidence the blue print produced by the witness and referred to in his answer to Q. 264, and the same is marked "Complainant's Exhibit flattening plates of Liddell Paper Bag Machine," A. B. C., Notary Public. December 5, 1903.*]

[*Defendant's counsel objects to the blue print on the same grounds that he objected to the flattening plates which are represented by the blue print.*]

Q. 265. Please to produce, if you can, such a drop plate as

you have referred to as having been used on the old paper bag machine No. 88, in Sandy Hill, New York.

A. I now produce the plate referred to in my last answer as having been taken from the machine 88 which was altered by the introduction of the Liddell diamond-forming devices thereinto.

[*Complainant's counsel offers in evidence the drop plate produced by the witness and requests that it be marked Complainant's Exhibit "Drop Plate from the Old Paper Bag Machine, No. 88," A. B. C., Notary Public, Dec. 5, 1903, and the same is so marked.*]

[*Defendant's counsel admits that the drop plate just offered in evidence was used for many years prior to 1896 in a machine made in conformity with the Lorenz and Honiss patent, 361,951, of April 26th, 1887.*]

Q. Please compare defendant's paper bag machines proceeded against herein, with the paper bag machine of the Liddell patent in suit, and state the result of such comparison as to any superiority of one over the other, if there is any, in respect to adaptabilty for the manufacture of paper bags, and in actual operation, giving your reasons for any opinions you may express.

[*Defendant's counsel objects to this question because it implies that the paper bag machine of the Liddell patent is in existence; whereas it does not appear that a paper bag machine made in conformty to the Liddell patent ever existed anywhere. If the question is modified so as to ask the witness to compare the Walker model room machine of the defendant with the plan for the paper bag machine which is set forth in the Liddell patent; the question thus modified will be proper and will not be objected to.*]

A. I have already referred, in a former answer and in general terms, to an inferiority in defendant's machines, as compared with the machine shown and described in the Liddell patent in suit, growing out of the fact that in said defendant's machines the supporting pivotal axis of the forming plate, while remote from the creasing edge of said plate, is less remote from said edge than shown in the Liddell patent. I there men-

42 tioned that by reason of the situation of this pivotal axis nearer to the creasing edge in defendant's machine, said plate, in these machines, are given less time in which to swing and less distance of travel with the cylinder, in the diamond-forming operation. It remains to be explained that such more rapid swing of the forming plate or tucker, accompanying a given speed of the cylinder, is objectionable, because it imposes greater strain upon the paper of the blank with a correspondingly increased liability to wrinkle or tear it. Hence, supposing a given sized machine constructed under the Liddell patent and one of defendant's machines of the same size, to be run at the same peripheral speed of the cylinder (and therefore passing out the same number of bags per minute) the machine of
43 the Liddell patent will be less likely to wrinkle or tear the paper and more likely to make perfect bags, than the defendant's machine, and the percentage of waste in the product of the Liddell machine will be less than that in the product of the other machine. Or, supposing this defendant's machine to be run up to its limit of capacity, as determined by the rapidity of action of its forming plate, with safety to the paper, the Liddell machine can be run at a much higher speed of production while giving to the forming plate no higher speed than that of said defendant's machine, and the output of the Liddell machine will be correspondingly greater than that of the defendant's machine.

All this appears clearly from the Liddell patent itself when
44 compared with defendant's machine, and without any reference whatever to "Complainant's Exhibit Operative Machine of the Liddell Patent in Suit," and said actual machine only verifies my statement concerning the patent in this respect. And it is obvious, both from the Liddell patent alone and from said actual Liddell machine, that the capabilites of the Liddell machine may be varied unfavorably by shifting the supporting axis of the forming plate nearer to the creasing edge of the plate just as the defendant's machine has been unfavorably varied from the Liddell patent by the same means. To illustrate this possibility, I here produce a blue print entitled "Liddell Paper Bag Machine—Forming Plates Showing Modified

Positions of Trunnions." In Fig. 1 of this blue print the axial shaft *c* is shown attached to the forming plate E of the Liddell patent pratically where it is shown to be attached to said plate in the Liddell patent drawing and in the Liddell actual machine. The plate is shown in this Fig. 1 in its starting position, again, an upright position and, again, in its most advanced position of contact with the cylinder. In the movements of its creasing edge from the first position to the last, it has first come into contact with the cylinder at the number 4 of the graduated scale marked on said cylinder and has continued in contact with the cylinder while the point 4 has moved to the point 15, the action of the plate in the formation of the diamond having continued the distance from 4 to 15, or eleven numbers.

In Fig. 2 of this blue print, the same axial shaft *c* connects with the forming-plate nearer to the middle of the plate, and in this case the forming-plate edge acts in conjunction with the cylinder only from 4 to 11 of the same graduation, or through only seven numbers of the scale. In Fig. 3 of the blue print the axial shaft *c* is placed still nearer to the creasing edge W of the forming plate and the said edge W of the plate will act upon the blank only from 4 to between 6 and 7 of the scale, or through less than three numbers of said scale.

It is evident that if three Liddell machines should be built in accordance with these three figures, respectively, of the blue print, and if the cylinders were run at the same speed peripherally, the forming-plate of the machine according with Fig. 1 would move with much less speed and would be in action upon the blank much longer, than in either of the other two machines, and that in the machine made to accord with Fig. 3 the movement of the forming-plate would be exceedingly rapid, comparatively, and its action upon the blank exceedingly brief. And, as there is a limit to the practicable reciprocatory movement of the forming-plate, the Liddell machine built according to Fig. 3 of this blue print could not be run so rapidly as either of the other two machines could be run. Besides the mechanical limitations upon the reciprocatory speed of the forming-plate, there are, moreover, the limitations imposed by

the tendency of the paper to tear, and, consequently, it is clearly evident that the best form in which the Liddell machine may be constructed under the patent will be that form in which the supporting axis of the forming-plate is most remote from its creasing edge. Conversely, the least desirable form in which the Liddell invention may be embodied, is that wherein the supporting axis of the plate E is nearest the creasing edge of said plate. This is conspicuously true of the machine when the forming plate E is reciprocated in returning it to its starting position, but it will also be true in a Liddell machine wherein the forming plate is rotated continuously from and to its starting position.

The blue print just submitted seems to me to plainly show that the Liddell invention, as set forth in the patent in suit, is not confined to the location of the pivotal axis or trunnions of the forming-plate at any specific distance from the creasing edge of that plate, and that the machine of the patent may be made a good machine or a bad one, or one not so good as it might be, by mere variation of this location of said pivotal axis of the plate. Of course it follows that defendant's machine is none the less in accordance with the Liddell patent by reason of placing the pivotal axis of the plate nearer to the creasing edge thereof than it would better be; and that it is only a less desirable embodiment of the Liddell invention than it might be.

[*Adjourned to Monday, December 7th, 1903, at 10:30 A. M.*]

Monday, December 7th, 1903, 10:30 A. M.

[*Met pursuant to adjournment.*]

Present—The Notary, and Counsel as before.

[*Mr. Dayton continues his answer to Q. 266.*]

If one will give a turn to the Walker Model-Room Machine, or "Complainant's Exhibit No. 7, Model of Blank Feeding and Diamond Forming Parts of machine made by the Woodward & Rogers Company for the Continental Paper Bag Company"

bearing also the mark "Model of Blank Feeding and Diamond Forming Parts of Continental Bag Machine," he will observe that the forming plate swings with relatively great rapidity, and remains a considerable time at rest between its forward and backward movements, and if he will make a similar examination of the "Complainant's Exhibit Operative Machine of the Liddell Patent in Suit" he will observe a marked difference in this respect. In other words, the forming-plate of the Liddell machine will be seen to turn on its axis with much less speed, relatively, and to remain at rest and idle a much shorter time. These observations direct one to the explanation for the adoption in Defendant's Machine of the inferior and objectionable arrangement of the pivot of the forming-plate so much nearer the creasing edge of the plate than shown in the Liddell Patent in suit. And it becomes evident that such objectionable location of the pivot plate results from the election by the constructor to give a movement inwardly and outwardly of the cylinder periphery instead of a movement outwardly and inwardly of the pivot of the plate, as is done in the Liddell patent. Whichever alternative is chosen, the farther the pivot of the plate is placed from the creasing edge thereof, the greater the distance of movement of the part to which movement is actually given. In giving movement to the pivot of the plate, such movement may be conveniently made of any desired extent; but in giving movement to the periphery of the cylinder, operative limitations to such movement are encountered. It is not desirable that the movable section of the cylinder periphery shall be moved far inward, and to avoid this defendant has chosen to sacrifice an important degree of merit in the machine by placing the pivot of the forming-plate nearer to the creasing edge thereof, by which a not too great inward movement of the cylinder periphery is called for.

It thus appears that while defendant's machines still embody the Liddell invention, in giving relative movement between the surface of the cylinder and the supporting pivot remote from the axis of the forming-plate and while, as Mr. Stone admits, it was not less obvious that the periphery of the cylinder, instead of the pivot of the plate, might be given the ac-

tual movement to secure such relative movement between these two parts, it was not Liddell who blundered in making his choice of which of these parts to actually move, as Mr. Stone more than intimates. On the other hand, Liddell, as it appears to me, not only conceived a radically and strikingly novel inventive idea, but he exhibited excellent mechanical judgment in his choice of the particular form in which to embody that novel idea. At the same time his patent is fortunate, or, rather, is wise, in covering the invention, whatever its particular embodiment in this respect, and said patent, in my judgment, applies as fully and perfectly to defendant's machine as to the particular embodiment of the Liddell invention selected for illustration and description in the patent in suit.

[*Recess.*]

[*Defendant's counsel objects to the foregoing answer of 2,000 words, to Q. 266, because that answer is confined to a single difference between the so-called Liddell machine and the defendant's paper bag machine, instead of attending to all of the proved differences between those machines; and because in respect of the single difference attended to the answer is superficial and incomplete, and is purely theoretical even as far as it goes.*]

[*Complainant's counsel offers in evidence the blue print produced by the witness in connection with his answer to Q. 266, and which he has therein referred to as "Liddell Bag Machine—Forming-plates Showing Modified Positions of Trunnions"; and the same is marked "Complainant's Exhibit Liddell Paper Bag Machine Forming-plates Showing Modified Positions of Trunnions," A. B. C., Notary Public, Dec. 7th, 1903.*]

[*Defendant's counsel objects to the blue print as not admissible on rebuttal, though it would have been admissible in connection with the theoretical testimony of the witness relevant thereto if that testimony had been taken and the blue print had been offered as part of the Complainant's evidence in chief.*]

Q. 267. Please refer to the testimony of defendant's expert Wilbur M. Stone herein, and more particularly to his answers to Q. 11 and 12, when first called for defendant (see pages 186-192, D. P. R.), and to his answers on cross-examination upon said testimony referring specially to the question of whether the forming-plate operating devices actually shown in the Liddell Patent in suit are operative or not. State any respects in which you agree or disagree with Mr. Stone's testimony on this point, and your own opinion thereon, giving your reasons for such opinion as you express.

A. Said question 11 addressed to Mr. Stone called for a critical examination of the Liddell patent in suit "with a view "to ascertaining and stating the mechanical merits or other-"wise, of the organization of mechanism which it presents for "opening out one end of a tucked paper tube * * * into "the diamond form shown in Fig. 8" of the Liddell patent drawings.

Question 12 inquired "whether it would be possible for any "man to lay out the cams K and K', with such profile, and to "proportion the arms F and F', and the gears M' and N in "such way as to cause the edge W of the plate E to travel for-"ward, adjacent to the periphery of the cylinder C, in an arc of "a circle concentric with that cylinder. * * * And if you "think that result possible, then please to state what class of man "would have to be called upon to produce that result."

In his answer to Q. 11, Mr. Stone, on page 188, D. P. R., expresses the opinion that a machine "built according to the "drawings and specifications of the Liddell patent, would be "inefficient to properly produce a perfectly formed square bot-"tom paper bag from a tucked paper tube," in six specified particulars, fully stated on pages 188, 189 and 190.

The first particular relates to the cams K and K' which are declared to be shown of improper profile, and to the gears M' and N, which are declared to be of improper ratio to impart, through the arm F and the train of gears M' M M and N, a movement to the edge W of the former plate E coincident with the surface of cylinder during the rotary movement of said cylinder. Mr. Stone produces the defendant's drawing No. 10,

in which the various gears, arms, and cams referred to are carefully reproduced on an enlarged scale, to show that he is correct.

It is only with reference to this first particular or specification of Mr. Stone's answer to question 11, that I feel called upon to comment in this answer, having already reviewed the five remaining particulars of the answer quite fully. And it will be seen that question 12 is confined to the subject matter of this first specification.

I have already expressed the opinion that the drawings of the Liddell patent do not show the exact outlines of the cams K and K′ necessary to a practical machine, and I gave that as my opinion in my deposition in the opening case. Mr. Stone has, therefore, only repeated and demonstrated the correctness of my original opinion concerning said cams, by his defendant's drawing No. 10; but, as to his further criticism of the Liddell patent drawing in the first branch of his answer to question 11, I do not agree with him. In other words, I deny that it is necessary to change the ratio of the gears M′ and N in order to enable properly shaped cams K and K′, to impart, through said gears M′ and N, through the arm F and through the train of gears M′, M M and N, (formed and proportioned and arranged precisely as they are shown in Fig. 1 of the Liddell patent drawing), a movement to edge W of the former plate coincident with the surface of cylinder during the rotary movement of said cylinder. And I produce a working, diagrammatic model carefully enlarged just four and a half times, from said Fig. 1 of the Liddell patent drawings, to demonstrate the correctness of this assertion. The cams K and K′ only have been changed, and these have been given their proper outline to co-act with the gears which are unchanged in ratio, arrangement, or other particulars, and with the arms F and F″, also unchanged in form, relative size and arrangement. By turning the crank on this model anti-clock wise, the proper movements are given to the other parts, and, in such movements, it will be seen that the point answering to the edge W of the former plate E coincides with a tooth on the large gear wheel, and pursues a circle, answering to the circumference of the cylinder C (which

is concentric with said large gear), in the rotary movement of said large gear wheel.

In his answer to question 12, Mr. Stone said:

> "It is within the scope of human ability to so proportion the cams, arms and gearing set forth in the question, as to cause the edge W of the forming-plate to travel in a line concentric with the centre of the cylinder C; but to so lay out and proportion said parts would require the skill of an an expert draughtsman, and it would take some considerable time to do."

As a matter of fact there has been no reproportioning at all of the arms and gearing here referred to, and the only thing that had to be done in making the model was to work out the cams K and K′ to the proper profile, which is what is always expected of the builder of any machine illustrated and described in a patent. And while it is no objection to any patent that indicated cams thereof will require to be put into working shape, or that this may be done by an expert draughtsman or that it may take such a draughtsman a considerable time to do it, neither an expert draughtsman nor any considerable time are required in practice for outlining such cams, because this is more easily, accurately and expeditiously done in the regular machine shop by way of proceeding, namely, by putting the parts through their movements and scratching plates fastened in the places of the cams and subsequently cut to the resulting outlines.

This subject was taken up in the cross-examination of Mr. Stone and especially in cross-questions 84 to 107 inclusive, pages 264 to 275, D. P. R. In his answer to x-Q. 84 Mr. Stone says, "I seriously question as to whether it is possible to make cams that would be operative" to impart the desired and described movement to the plate E. In his answer to x-Q. 87 he says:

> "While it might be possible for a skilled mechanic to lay out a theoretic cam outline or outlines for the purpose set forth in the Liddell Patent, I believe that outline

or outlines would be physically impracticable, if not inoperable."

In answer to x-Q. 96, asking whether, "without changing the ratio of the gears M′ and N, no cams could be provided in place of the cams K and K′, which would give to the plate E the desired motion," Mr. Stone says:

"I believe that no cams which were practicable, could be so provided."

In his next answer he states that this belief that no practicable cams could be provided "without changing the ratio of the gears M′ and N is deduced from a careful and exhaustive study of the requirements."

In his answer to x-Q. 100, Mr. Stone says:

"A change in the ratio of the gear M′ and N would not be sufficient to entirely obviate the difficulties in a theoretic outline of the cams K and K′."

I have quoted these particular answers by Mr. Stone for the purpose of pointing out that the cams K and K′ present in the model just produced, are entirely practicable and operable in their outlines, for a practical and successful machine, and that said model, therefore, is a complete and unanswerable refutation of these statements or opinions of Mr. Stone, and of his entire testimony on this subject.

In his answers to x-Q. 109 and 110, Mr. Stone says it would be necessary to change the shape of either the arms F or the arm F′, and specifies the change to be necessary in the arm F′, giving as his reason that,

"It is impossible for the horn of said arm to follow the profile of the cam K′, as shown in the Liddell Patent."

But in his next answer he treats this as an inexcusable blunder, and says, "It should have been within the ability of an ordinary draughtsman to have avoided the interference between the cam K′ and the arm provided to co-act therewith, as shown in the drawings of the Liddell Patent." In the model produced there has been no change made in the arm F′ and

there is no interference, such as Mr. Stone alleged. The "horn" or point of the arm F′ has been simply thickened horizontally or extended backwardly away from the eye, in a manner perfectly consistent with any showing of the patent and perfectly familiar in machine shop practice, so that the asserted interference between the cam and the arm is avoided. This apparently did not occur to Mr. Stone, who began his answer to x-Q. 111 by saying,

> "I do not consider it frivolous, as the change involves a change in the ratios of the arms, F and F′, which should be considered conjointly with the cam profiles, and involves a dual problem; nor would the change in the arm be simple and obvious."

How "simple" and how "obvious" the matter was to an actual mechanic, notwithstanding Mr. Stone's assertion to the contrary, is plainly shown by the model here referred to.

The expedient shown in the model and just mentioned was called to the attention of Mr. Stone in x-Q. 115, and the compatibility of the patent drawing with that construction is admitted, the only objection left to Mr. Stone being that the drawings "do not show it."

Further cross-examination was directed to the absence from the Liddell Patent drawings of a spring or other means to hold the roller *k* in contact with the cam K upon which it works, and, in the very presence of a spring for holding the arm F′ to the other cam K′, Mr. Stone said, in answer to x-Q. 117, that "it would not be obvious just how or where to apply" means for holding the roller to the cam K, or what means to use for this purpose, but that "it would be quite within his [a skilled mechanic's] ability to both devise and apply such means." I referred to this matter heretofore in connection with the making of the cams grooved in the actual Liddell machine, but I mention it again and here in connection with the fact that Defendant's Drawing No. 10, previously produced by Mr. Stone, has a coiled spring applied to the slide carrying the roller which bears on the cam K, which spring is a mere duplicate of the spring copied in the same Defendant's Drawing No. 10

from the Liddell Patent and there shown for the purpose of holding the arm F′ against the cam K′.

Having shown by the model just produced that no change in the ratio of the gears M′ and N as shown in the Liddell Patent, is necessary for operativeness, and that only the cams K and K′ need to be changed by giving them a proper contour (which the Liddell Patent did not need or pretend to show), I now briefly explain why a reduction in the relative diameter of the gear N is mechanically desirable, though not necessary. The reason is that, the larger the diameter of said gear wheel N, the longer the lever (the radius of said wheel) by which said wheel and the forming-plate is oscillated, and accordingly the greater the oscillatory movement required of the rack wheel M′, and, consequently, the greater the throw required to be given to the cam K for rocking said rack wheel. It is simply good mechanics to reduce the throw or eccentricity of a cam where this can be done without sacrifice, and accordingly a good mechanic or machine designer will naturally make the gear N smaller in diameter than the rack wheel M′.

A very simple and purely mechanical matter it thus becomes.

[*Adjourned to Tuesday, December 8th, 1903, at 10:30 A. M.*]

Tuesday, December 8th, 1903.

[*Met pursuant to adjournment.*]

Present—The Notary, and counsel as before.

[*Defendant's counsel objects to the foregoing answer of 2,000 words to Q. 267 on the ground that it constitutes only a superficial, incomplete, partisan argument in respect of Mr. Stone's testimony, and does not constitute an accurate scientific statement of the factors of the problem to which it relates; and because instead of being confined to the opinion of the witness, it assumes to state as facts some conclusions of theory upon which the witness was wrong in his theorizing. Defendant's counsel does not object to a theory being stated as a theory, but he does object to a theory being stated as if it were*

proved an undeniable fact, particularly where the theory illustrated is superficial and erroneous.]

[*Complainant's counssl offers in evidence the model produced by the witness in connection with his answer to Q. 267, and same is marked "Complainant's Exhibit Model from Fig. 1, Liddell Patent. A. B. C., Notary Public, December 8th, 1903."*]

[*Direct-examination closed.*]

[*Cross-examination by* Mr. ALBERT H. WALKER.]

x-Q. 268. Have you totally abstained from consultation or conversation with every other person relevant to whatever you understand to be involved in the present case, at all times, since November 12th, 1903, when I inserted in the record a request to you to thus totally abstain?

A. I have not.

x-Q. 269. Have you kept a record in writing of every consultation that you have engaged in since that time with any person relevant to what you understand to be involved in the present case?

[*Complainant's counsel, in order to possibly shorten this line of cross-examination, admits that the witness has been in consultation with reference to this deposition since the date mentioned and under the direction and instructions of complainant's counsel and to the extent complainant's counsel considered proper and necessary in carrying forward this deposition, and almost entirely, however, in connection with testimony to be given by the witness and prior to questions being put upon the record and as counsel considers, is entirely proper in connection with expert witnesses and in accordance with what counsel understands to be the universal practice in taking expert evidence in patent cases. But counsel specifically states that no portion of testimony of the witness, after being given on the record, has in any way been altered as stated on the record, except by consent of defendant's counsel to correct accidental or manifest errors, nor has counsel nor the witness prepared in any way in advance the statements made on the record*

by witness as to form, nor has the witness been under any compulsion whatever as to his testimony.]

[*Defendant's counsel objects to the foregoing statement of complainant's counsel as being an impertinent attempt to substitute his own story for the testimony of the witness upon the subject to which the question relates, and as being a plain case of "coaching" the witness in respect of the testimony he is to give on cross-examination.*]

A. I have not, but I think I could now state the general subjects and scope, if desired, from which it will appear that there has been no coaching nor attempt at coaching in the matter.

x-Q. 270. Please to state the names of all the persons you have consulted with relevant to whatever you understand to be involved in the present case; and which consultations have occurred since when on November 12th, 1903, I requested you to keep a record in writing of every such consultation.

A. I notice that the question uses the word "consultations," exclusively, and does not include the word "conversation," which was coupled with the word "consultations" in question 268, first asked me on cross-examination. There have been numerous conversations and few consultations, properly so-called, excepting consultations over drawings and models proposed to be used as exhibits or already in the case. Such conversations and consultations relating to the flattening-plate, on Complainant's Exhibit Operative Machine of the Liddell Patent in Suit, have had their occasion almost altogether since November 12th, and they were had largely with Mr. William A. Lorenz, though shared with complainant's counsel. Other conversations or consultations have been had with Mr. Lorenz and with defendant's counsel concerning some of the drawing exhibits and particularly "Complainant's Exhibit Drawing Walker Model-Room Machine, Perspective Views." I also have conversed with Mr. Lorenz and with a Mr. Merritt (who, I understand, is in Mr. Lorenz's employ) concerning the model last offered in evidence, representing Fig. 1 of the Liddell Patent in suit. I have also conversed with Mr. Ward, a model constructor and machinist in complainant's employ, concerning "Complainant's Exhibit, Operative Model from [Defend-

ant's Exhibit] Liddell Drawing No. 1," and in some of these consultations, which covered the question of constructing another model or models, complainant's counsel took part. I was also called into consultation with complainant's counsel and with Mr. Ward concerning the "Complainant's Exhibit Dayton Model Optional Movements," and, having myself made an original pencil sketch, I directed Mr. Ward to make therefrom "Complainant's Exhibit Dayton Sketch Optional Movements." I think it was with Mr. Chambers, of counsel for complainant, that the question of these last two mentioned exhibits originated, and I was told by him his views as to their desirability. I have also talked with Mr. Ward concerning Complainant's Exhibit No. 7, representing Defendant's Rumford Falls Machine, and chiefly with a view to having said model put in order for hand operation.

I think I have given above the names of all the persons with whom I have consulted or conversed, and the general subjects and scope of the interviews had with them.

[*Defendant's counsel objects to the foregoing answer of nearly 500 words to x-Q. 270, in view of the fact that that question called only for a list of names.*]

x-Q. 271. Please to listen to the reading of x-Q. 270 and then answer that question and say no more than to give the list of names that question calls for.

A. I will ask counsel to state what he means by the words "involved in the present case," and particularly whether he means to include the models and drawings or other actual or possible exhibits. I ask this because, if these are included in the words referred to, I will include certain names which I would omit if the issues of the case alone were meant by these terms.

[*Defendant's counsel states that x-Q. 270 is not confined to the issues of the case, but includes whatever the witness understands is involved in the present case, and thereby clearly includes all the drawings and models which have been made the subject of the testimony of the witness.*]

x-Q. 272. Please now to answer x-Q. 270, as it stands, and to not omit from the list of names the name of any person with

whom you consulted since November 12th, 1903, relevant to any subject which has been attended to by you in your direct-examination since that day.

A. Answering in view of counsel's explanation following my answer to x-Q. 271, and treating all conversations concerning models, drawings, and so forth, as "consultations," I give the name of Mr. Francis T. Chambers and Mr. S. R. Betts, both of counsel for complainant, Mr. William A. Lorenz and Mr. Merritt, who have had charge of the preparation of principal drawings and models, and Mr. Ward, who has made other models and one tracing.

x-Q. 273. Your direct-examination in rebuttal for the complainant in this case has now been going on every secular day, except Thanksgiving Day, for more than a month, and during that time you have presented a large number of blue prints and a number of models and one paper bag machine to the inspection of defendant's counsel, and have testified at great length about those blue prints and models and that machine. Now, I want to ascertain and record the intellectual origin of those things respectively, and to begin with I inquire, who it was that made the paper bag machine which you showed me operating, at 451 Washington street, in this city, making complete commercial paper bags at a high rate of speed, and which was put in evidence under the name of "Operative Machine of Liddell patent in Suit?"

A. Speaking first of the diamond-forming devices of said operative machine of Liddell patent in suit, they had, so far as I know or as this record shows, their "intellectual origin" with William Liddell, as indicated by the patent in suit. The tube forming mechanisms and the pasting and flap folding mechanisms of that machine, apparently had their "intellectual origin" with William A. Lorenz and W. H. Honiss, as generally indicated by the Lorenz and Honiss patent, No. 361,951, under which the original machine No. 88, appears to have been built, long prior to the introduction of the Liddell diamond-forming mechanism. The machine as it stands was, as I am informed, produced by Mr. William A. Lorenz of Hartford, Conn.

[*Defendant's counsel objects to the statement that the dia-*

mond-forming devices of said operative machine had their intellectual origin, so far as this record shows, with William Liddell; because the question did not ask the witness to state the intellectual origin of anything, but only to state a fact in respect to the manufacture of a particular machine; and because William Liddell has positively and elaborately testified in this record that the diamond-forming mechanism in question did not have its "intellectual origin" with him.]

x-Q. 274. Did you take any part whatever in manufacturing said so-called operative Liddell machine?

A. I did not.

x-Q. 275. Are you not quite mistaken in saying that the tube-forming mechanism of that machine was constructed under the Lorenz & Honiss patent, No. 361,951, and on that point I call your attention to the fact that that patent does not describe or claim any tube-forming mechanism whatever, and expressly states that it shows a machine which automatically manufactures square bottom paper bags from continuous tucked paper tubing, and does not purport to show a machine for manufacturing such tubing.

A. I was mistaken in my answer to x-Q. 273, in indicating that the tube-forming mechanism of the operative Liddell machine, came originally from the Lorenz & Honiss patent 361,951. It is there partly shewn in Figs. 15 and 16, but was patented by these inventors, I believe, in an earlier patent of which I have no copy present.

x-Q. 276. It is true, is it not, that that so-called "Operative Liddell Machine" contains three grand divisions, the first of which produces a tucked paper tube, and the second of which opens one end of that tucked paper tube and folds it down into a diamond form, and the third of which applies paste to the bottom of that diamond form and then folds over the final flaps to complete the paper bag; and it is also true, is it not, that the first and the third of those grand divisions were invented and patented by Lorenz & Honiss many years before 1896?

A. The question states correctly the broad or general divisions of the machine, as a whole, and also correctly states the fact as to the early origin and patenting of the first and third

general divisions of the machine. I think it should be understood, however, that the bringing together of the three divisional inventions or structures, as broadly defined in the question, involves connecting mechanisms leading from one division to another, to make the machine complete and operative, as a whole, for the production of complete paper bags. For example, the tube-forming mechanism forming the first division of the machine, does not embrace a device for severing the continuous tubes made thereby into separate bag blanks, nor does either the tube former or the diamond former in itself embrace the usually present means for accelerating the speed of the sections into which the tube is severed, when, as a fact, such tube is completely severed, into separate bag lengths. So, going to the point in the machine beyond the diamond-former and between it and the pasting and flap folding mechanism, there will here be provided, in a complete machine, suitable means for transferring the diamond-formed blank to the pasting and flap-creasing mechanism, and also means for holding the paper of the diamond in form during such transfer. The machine cannot be chopped into three pieces, of all which it can be said that this piece is the tube former and nothing else; this is the diamond former and nothing else, and this is the flap paster and folder and nothing else. The essential tube former may be of one man's invention, the diamond former of another's, and the flap pasting and folding mechanism of another's, and, from a dozen of each of these, many different machines may be composed by transposition of these separate principal parts; but, in each assemblage or collocation, appropropriate intermediate or connecting mechanism will need to be selected or contrived to make the complete machine.

x-Q. 277. It is true, is it not, that the so-called Operative Liddell Machine contains two subordinate divisions, the first of which is interposed between the first grand division and the second grand division, and consists of a striker and a slacker; and the second of which subordinate divisions consists of means for transferring the diamond formed blank from the second grand division to the third grand division of the machine, and for holding the blank in form during that trans-

fer, and it is also true, is it not, that both of these subordinate divisions are to be found in Lorenz & Honiss patents issued long prior to 1896?

A. It is true that the operative Liddell Machine contains a striker and a slacker, concerned in severing the continuous paper tube into bag lengths, between the tube former and the diamond former; and it is also true that said machine contains means for transferring the diamond formed blank from the diamond former to the succeeding mechanisms for pasting, creasing, and folding the flaps of the diamond to make the complete bag. It is further true that intermediate devices for these connective purposes were old at the date, 1896, and that, in certain forms, suited to the mechanisms they connected, they were disclosed in Lorenz & Honiss patents issued prior to that year.

x-Q. 278. It is true, is it not, that the particular striker which severs the bag blanks from the forward end of the continuous tucked paper tubing, in the so-called Liddell Machine, is shown in the Lorenz & Honiss Patent, 361,951, doing the same work?

A. Substantially the same striker is shown in said Lorenz & Honiss Patent, 361,951, at 61, Figs. 17 and 18.

x-Q. 279. Do you know the origin of the particular slacker which is in the so-called Liddell Machine and which operates in that machine to first retard the speed of the tube in advance of the striker so as to make a slack in that tube to facilitate the work of the striker, and which slacker afterwards accelerates the speed of the same paper, so as to make up for lost time in the progress of that paper through the machine?

A. I have not looked up the question of the origin of the particular slacking mechanism referred to in the question, and cannot now state it.

[*Recess.*]

x-Q. 280. I now show you a copy of the Lorenz Patent No. 444,728, of Jany. 13, 1901, and I call your attention to Figs. 4, 5 and 6 of that patent and to claims 8, 9 and 10, thereof, and ask you to state whether the slacker shown in those figures and attended to in those claims, is the same mechanism which is

interposed between the tube-forming mechanism and the diamond-forming mechanism of the so-called Liddell Machine at No. 451 Washington street.

A. The mechanism to which my attention is called in Patent 444,728 is very closely similar to that of the Liddell machine.

x-Q. 281. It is true, is it not, that the so-called Liddell machine at No. 451 Washington street, has a total length of 15 or 16 feet between the end which contains the continuous roll of paper and the place where the completed bags are delivered by the machine; and that the diamond-forming mechanism of that machine occupies only about two feet or less of that total length?

A. The question evidently includes a carrier device which has not been heretofore referred to in this cross-examination, and which stands at the delivery end of the machine proper to receive the folded bags therefrom and to transport thm between compressing belts quite a distance to the final point of delivery in a receiving trough, as shown in Complainant's Exhibit Photo No. 1. This carrier device is a separate machine in itself, occupying perhaps five feet of space on the floor. The entire paper bag machine proper is, I should think, about 9 or 10 feet in length over all, including the paper roll carrier, the long tube-forming mechanism, the blank severing devices, the diamond-forming devices, and the pasting and flap folding mechanism. I think the Liddell contribution to the machine occupies about two feet of its total length.

x-Q. 282. Now, to save time and words, I will briefly state what I understand to be the history of the so-called Liddell machine at 451 Washington street, and I will ask you to affirm or deny or modify my statement.

That machine was originally No. 88 of a large number of Lorenz & Honiss paper bag machines which have been used for many years, beginning in 1886, in the manufacture of exactly such bags as those which were manufactured on November 5th and November 16th, 1903, on that machine, at 451 Washington street. Early in the year 1903 William A. Lorenz was employed to take that old machine No. 88 and to substitute

for that part of its mechanism which made the diamond fold, another machanism to be constructed by him; and he was instructed to construct another mechanism as near like the Liddell Patent in suit as he could make it while making it operative to do its comparatively small share in the manufacture of exactly the same bags that had been made on the same machine for many years. In pursuance of that employment, Mr. Lorenz, in the year 1903, carefully designed and delineated in working drawing, a mechanism for doing that particular work in that machine, and he superintended the construction of that mechanism in accordance with that design and those working drawings, and he superintended the substitution of that mechanism in that machine No. 88 for the old Lorenz & Honiss diamond-forming mechanism of that machine. Thereupon, he spent much time and exercised much skill in attempting to run the machine in its entirety with that substituted mechanism therein, and finally succeeded early in November, 1903, in running that machine in the manufacture of good commercial paper bags identical in character with those which the machine had been making commercially ever since many years before 1896. Then, on November 5th, 1903, you first saw that machine, and saw it make several thousands of good commercial bags, and afterward testified to that manufacture in this case. On November 16th, 1903, that machine was again run in my presence and in your presence, and again made several thousand good paper bags. Still later, on December 1st, 1903, that machine was again run in your presence and in my presence with the flattening plate B substituted for the flattening-plate A therein, and again made more than one thousand good, commercial paper bags.

A. The alleged history given in the question covers many points that I know nothing about. I understand that the original machine No. 88, which was altered over into the complete machine now known as "Complainant's Exhibit Operative Machine of Liddell Patent in Suit," and containing the diamond-forming mechanism of the Liddell patent, was one of many which for several years had successfully turned out Deering

bags, which is the kind of bags now made by the exhibit machine. I personally know nothing of the instructions given to Mr. Lorenz, but understand that he was directed to build a machine containing the Liddell diamond-forming mechanism of the patent sued upon. I know also that the machine referred to does contain the diamond-forming mechanism set forth in the Liddell patent in suit and claimed therein in claims 1, 2 and 7. I do not know how long Mr. Lorenz was occupied in building the machine nor when it was finished. It is to be presumed that he made working drawings of the principal parts of the Liddell mechanism which he was to put into the machine, but, as I have previously testified, my understanding is that he did not make any working drawings of the outlines of the cams K and K′, but that he developed these outlines after the machine, in other parts, was constructed and set up, and by ordinary machine shop methods fully explained by me with the aid of drawings of appliances used in that method.

I do not know how much time was employed "in attempting to run the machine in its entirety," but I understand that it was successfully run, after construction and adjustment, prior to November, 1903, and before it was brought from Hartford, where it was constructed, to this city, where it now is.

I did first see the machine operate on November 5th, I think, and subsequently, on November 16th, and on December 1st, at all of which dates the machine ran all right and made several thousand good paper bags, as stated in the question.

x-Q. 283. Your answer lacks precision and completeness, and therefore I see that I must put isolated questions to you and ask for isolated answers. Please, therefore, to state whether that so-called Liddell machine at No. 451 Washington street, was originally No. 88, of a large number of Lorenz & Honiss paper bag machines, which have been used for many years, beginning in 1886, in the manufacture of exactly such bags as those which were manufactured on November 5th and November 16th, 1903, on that machine at 451 Washington street.

A. I understand that the machine which was altered over to contain the Liddell diamond-forming mechanism and which

is now at 451 Washington street, this city, was No. 88 of a large number of machines known as the Lorenz & Honiss machines, which have been used for many years, beginning perhaps in 1886, in the manufacture of exactly such paper bags as those which were manufactured on November 5th and November 16th, 1903, on said altered machine at 451 Washington street, this city, this kind of bag being known as the Deering bag.

x-Q. 284. How did Mr. Lorenz get possession and control of that old machine No. 88, for the purpose of substituting what you call the Liddell diamond mechanism for the old Lorenz & Heniss diamond mechanism which had been used on the machine formerly.

A. I don't know.

x-Q. 285. You stated about a month ago on your direct examination, that he got that machine in Sandy Hill, New York, which statement would indicate that you knew how he got it, or at least indicate that you had some knowledge on the subject. Please therefore to trace that machine from Sandy Hill, New York, to 451 Washington street in this city, and tell as much as you know about its history after it left Sandy Hill and before you saw it run on November 5, 1903, at 451 Washington street?

A. I stated that the machine was obtained from Sandy Hill, New York, on the strength of information to that effect, and my information, is further that it was shipped from Sandy Hill, New York, to Hartford, Conn., where the alterations in it were made under the directions of Mr. Lorenz. I was not present when the machine was taken from Sandy Hill, but had previously seen machines like it, and possibly this identical machine, at that place, where I studied the operation of one of said machines in turning out bags.

x-Q. 286. About what was the date of that visit of yours to Sandy Hill, New York?

A. This inquiry leads me to say that this particular machine could not have been one of those which I saw there in operation, because my visit to Sandy Hill was in September, 1903, I think.

x-Q. 287. How long prior to September, 1903, was it that Mr. Lorenz took the Lorenz & Honiss machine No. 88 away from Sandy Hill to Hartford, Conn.?

A. I cannot definitely say, though I believe I have been told.

x-Q. 288. Who originally suggested the plan of taking one of the old Lorenz & Honiss machines, and substituting for its diamond-forming mechanism another diamond-forming mechanism in more or less conformity to the Liddell patent in suit, with a view of introducing the machine thus altered into this case?

A. I don't know.

x-Q. 289. Did you have any agency of any kind in putting that old machine No. 88 into the shape it had when you first saw it operate on November 5th, 1903?

A. I did not.

x-Q. 290. Did you ever see that machine at all prior to November 5th, 1903?

A. I think I saw it the day before the making of the run referred to in the testimony, but was of the impression that November 5th was the date on which I first saw it.

x-Q. 291. I now show you the following blue prints: "Complainant's Exhibit Drawing Liddell Machine Parts Opening Diamond," and "Complainant's Exhibit Drawing Liddell Forming-plate Operating Parts," and "Complainant's Exhibit Liddell Paper Bag Machine, Cylinder and Pasting Roll," and "Complainant's Exhibit Liddell Paper Bag Machine Cams K and K′," and "Complainant's Exhibit Drawing Liddell Cam Delineating Devices," and I ask you to state what part, if any, you took in making those blue prints or in making the drawings from which they were printed or in making any calculations or in doing any thinking which was involved in making those drawings?

A. I took no part in the production of the drawings from which these blue prints were taken, but simply verified them after the blue prints were delivered to me.

x-Q. 292. Did that verification consist in comparing those five blue prints with the things which you understood them to

represent, or did that certification consist in comparing them with some other drawings or sketches or descriptions of those things?

A. The blue prints marked "Complainant's Exhibit Drawing Liddell Cam, Delineating Devices," and the blue print "Complainant's Exhibit Drawing Liddell Machine, Parts Opening Diamond," were directly compared with the machine and with the plates and parts illustrated on the former of these, which were used in determining the forms of the cams K and K′, but which are not permanent parts of the machine. I have also compared with the machine Complainant's Exhibit Liddell Paper Bag Machine Cylinder and Paster Roll, for its verification. The blue print Complainant's Exhibit Drawing Liddell Forming-plate Operating parts, was also compared with the machine by me and particularly as to the contour of the cams K and K′ of said exhibit. The Complainant's Exhibit Liddell Paper Bag Machine cams K and K′, has been verified by comparison with Complainant's Exhibit Drawing Liddell Forming-plate Operating Parts, which was compared directly with the machine and with the templets by which the cams were cut. The two blue prints marked "Complainant's Exhibit Drawing Liddell Paper Bag Machine cams K and K′, and "Complainant's Exhibit Liddell Paper Bag Machine Cylinder and Paster Roll" were made at my request to illustrate the particular parts to which they are confined.

x-Q. 293. How much time did you use in verifying all of the five drawings specified in my last question?

A. I cannot say; sufficient to satisfy myself that they were correct.

x-Q. 294. That satisfaction might have been partly or wholly based upon your confidence in the carefulness of the man that made the drawings, and may have been too credulous for aught I know. Please to state as near as you can how much time you did actually use in verifying all those five complicated blue prints?

A. I cannot state the exact length of time because I took no notice. There are upon "Complainant's Exhibit Drawing Liddell Machine, Parts Opening Diamond," certain ink marks

which were originally made in pencil at the time of verifying the drawing and subsequently inked in before the drawing was introduced in evidence. These black ink notations indicate that I verified the position of Fig. 1 of that exhibit to be the zero position (the same as 36) of the right hand cam disk, which bears a numbered scale adjacent to a stationary pointer. I also marked Fig. 2 as being the attitude of the paper and of the forming-plate at "about No. 6" of said scale. The marks on the other figures correspondingly indicate the scale positions obesrved in connection with these various stages of the diamond-opening process. I see also at the bottom of the sheet I noted that the arm H^2 dropped off cam I at $15\frac{1}{2}$ of the scale. These facts are mentioned to indicate that I took the proper steps to verify that particular exhibit drawing. I cannot say how long I was about this or was about other similar comparisons.

x-Q. 295. The verification stated in your last answer seems to me to amount to very little, because it does not purport to include any measurement of any of the parts or involve anything more than a glance at the mechanism in four different positions, and at the index certain points on which corresponded with those positions. When I speak of verification I mean verification. And verification includes every feature of form, construction, and combination shown in the five blue prints, and involves following every part of the blue prints with precision. Now, if you did not verify those five blue prints in that way, please to say so, and I will drop the topic. But if you did verify those five blue prints in that way, please to state as near as you can how long you occupied in doing that work?

A. This question leads me to say that defendant's counsel interrupted me in the last answer just before the concluding sentence, and demurred to a detailed statement of what I did. I had correctly stated what and all that anyone needed to do or state concerning the illustrate exhibit of which I had then spoken. I should have gone on to say that I had actually laid the working plates on Figs. 2 and 3 of Complainant's Exhibit Drawing Liddell Cam Delineating Devices, and also had laid the cam templets on the cams of Complainant's Exhibit Draw-

ing Liddell Forming-plates Operating Parts, and had found these to correspond, with slight evidence of shrinkage of the paper which is commonly observable in such cases.

As to Complainant's Exhibit Liddell Paper Bag Machine Cylinder and Paster Roll, I simply compared the parts shown in the blue print with parts on the drawing, and did not make any actual measurements because none were needed in the verification of that drawing. I repeat that I do not know how much time was occupied in this verification I should add that the Exhibit Cylinder and Paster Roll was not verified at the same time that the other verifications were made, that drawing not having been produced at that time.

x-Q. 296. Did you ever measure anything on either of the five blue prints and then measure the corresponding thing in the so-called Liddell Machine for the purpose of ascertaining identity or non-identity in those measurements?

A. I did so measure the only thing that calls for any measurement in the whole outfit, namely, the finger E′ on the forming-plate, shown in Complainant's Exhibit Drawing Liddell Forming-Plate Operating Parts, and such measurement resulted in finding them to correspond substantially in the drawing and machine.

x-Q. 297. Did you ever measure anything except the finger E′ which is shown on either of the five blue prints, and then measure the corresponding part of the so-called Liddell Machine to ascertain whether the two measurements agreed or disagreed?

A. I did make measurements, as I have already stated, concerning the cam templets and the plates employed in laying out the cams, not by means of a rule, but by the better way of laying the templets and plates directly upon the drawings themselves.

x-Q. 298. But those plates and templets constitute no part of the Liddell machine, and my last inquiry did not include them at all. Please to take notice of my question which I shall always frame to express my exact inquiry, and please to answer those questions as I put them and postpone statements on other subject to more convenient seasons. Now, please to answer my last question, and say no more?

A. I have not gone over the parts with a rule for the purpose of comparing their exact dimensions.

x-Q. 299. Did you ever make any measurement with a ruler or a pair of dividers, or a bit of string, or a piece of paper, or any other means whatever, of any one thing shown on either of the five blue prints, and of any corresponding thing in the so-called Liddell machine, to ascertain whether the two measurements agreed or disagreed, except in the single case of the finger E′?

A. I never did. I have simply and sufficiently determined that the drawings correctly represent the parts of the machine which they purport to represent.

x-Q. 300. You have said that you did lay the cam templets on the cams of "Complainant's Exhibit Drawing Liddell Forming-Plates Operating Parts." Now, please to state what things you refer to when you speak of cam templets?

A. The plates first described and cut to the outlines of the several cams K and K′, and which were used to determine the shape of the cams actually used in the machine.

x-Q. 301. Have you any personal knowledge that the outlines of those cam templets when you saw them, was identical with the outlines of the cams K and K′ in the machine, or is your information on that subject hearsay information only?

A. I was, as a matter of fact, so told by Mr. Lorenz, but I did make individual comparison as to one of the cams and its representative templet, but made no rule measurement.

x-Q. 302. Which cam was that which you visually compared with the templet?

A. The larger cam on the right hand side of the machine, which engages the arm F′, and which is lettered K′, and which in Complainant's Exhibit Drawing Cam Delineating Devices is marked "Yoke cam."

x-Q. 303. Am I right in understanding that you made no comparison whatever between the cam K and any cam templet, and made only a visual comparison, without any measurement, between the cam K′ and a cam templet?

A. That's exactly right. The machine works all right, it has a cam K, and it is utterly immaterial what the particular shape

of that cam is so long as it does its duty. I was satisfied to take Mr. Lorenz's word that the templets represented the cams in the absence of any possibility of laying the templet on the cam while the cam is on the shaft, or in any way establishing identity without the most minute, laborious, and greasy operation.

[*Defendant's counsel objects to all of this answer except the first three words, as being uncalled for and in the nature of a partisan argument intended to break if possible the force of the fact admitted in the first three words of the answer.*]

[*Defendant's counsel states to the court that the particular shape of the cams in the machine is not immaterial, because one shape might work during the few minutes occupied in making a thousand bags, while being too steep in some of its inclinations for constant commercial use; and because it is material to know how much and in what way the cams of the so-called Liddell machine differ in their outlines from the cams of the Liddell Patent.*]

[*Defendant's counsel suggests to the court that it has now been proved by cross-examination of this witness that he does not know that the cams shown in the five blue prints do agree with the cams on the so-called Liddell machine; and that point having been developed beyond denial, the defendant's counsel requests the court to disregard all those blue prints in respect of those cams.*]

[*Defendant's counsel also suggests to the court that the entire absence of verification by the witness of all the parts (except only the finger E') shown in the five blue prints, as compared with the so-called Liddell machine, deprives those blue prints of all probative power and significance in respect of the construction of any parts of the so-called Liddell machine; and defendant's counsel requests the court to disregard all those five blue prints as not constituting any legal evidence of anything.*]

X-Q. 304. Which of the five blue prints specified in X-Q. 291 were made since November 12th, 1903?

A. Complainant's Exhibits Liddell Paper Bag Machine

Cams K and K′ and Liddell Paper Bag Machine Cylinder and Paster Roll, were directed to be made prior to November 12th, I think, but were actually received by me subsequent to that date, as nearly as I can now recall.

x-Q. 305. Please now to look at "Complainant's Exhibit Liddell Paper Bag Machine, Two Modified Forming-plate Operating Plans," and state whether you did anything toward contriving or designing those two theoretical combinations of mechanisms which were shown in Figs. 1 and 2 of that drawing consecutively, and which purport to represent combinations differing from the Liddell Patent, but said by you in your direct-examination to be within the scope of the Liddell claim.

A. I did nothing toward designing the devices shown on this blue print?

x-Q. 306. Who did design and draw those devices?

A. They were furnished by Mr. Lorenz, and presumably are his designs, though I know nothing about that.

x-Q. 307. Please now to look at Complainant's Exhibit Liddell Paper Bag Machine Forming-plate Showing Modified Positions of Trunnions," and state who originated that argumentative blue print, and who designed and drew that drawing for the purpose of illustrating that argument?

A. The drawing was furnished by Mr. Lorenz, I believe.

x-Q. 308. Did the argument which is involved in the drawing and which you stated in your direct-examination in connection with the drawing, originate with you, or did it originate with Mr. Lorenz, or if not with either, then with whom did that argument originate?

A. The drawing merely illustrates an obvious fact that the supporting axis of the Liddell forming-plate may be, within limits, varied in its distance from the creasing edge W of that plate. This fact can hardly be said to have originated with anybody, other than Liddell. It was recognized by me, by Mr. Lorenz, and by counsel, I believe, from conversations had with these gentlemen, before giving my present deposition, but with whom the idea of illustrating this fact in a drawing originated I cannot now say.

x-Q. 309. What you call an obvious fact is not obvious, but

can be recognized only after close analytic thought, and whether obvious or not it lacks definement in your own statement of it, because that statement includes the phrase "within limits" without indicating what limits are referred to. Moreover, the alleged obvious fact is only a part of the elaborate argument which you made and inserted in your direct examination when you were expounding this blue-print, and which argument was inserted by you as the more than 1,200 words in the first five paragraphs of your answer to Q. 266. Now, please to state who it was that originated that whole argument, which purports to show a theoretic ground of superiority of the Liddell machine over the defendant's machine?

[*Adjourned to Wednesday, December 9th, 1903, at 10:30 A. M.*]

Wednesday, December 9th, 1903.

[*Met pursuant to adjournment.*]

Present—The Notary, and Counsel as before.

A. I see no reason for changing my opinion or statement that the fact illustrated by the drawing is obvious, namely, that the supporting axis of the Liddell forming-plate may be varied in its distance from the creasing edge of that plate. Perhaps it is true that the fact of placing the axis materially closer to the creasing edge of the plate than is shown in the Liddell patent will develop, in an actual machine, a more or less objectionable action and give relative inferiority to that machine, is one to be learned by observation or by reflection and deduction, but this does not render the fact of possible variation in the position of said axis less obvious. If I recollect right, I stated the obvious possibility of changing the distance of the axis from the edge of the plate in one or both of my depositions in the opening cases. And I remember that Mr. Ward, who built models of the Liddell and defendant machines, was the first to remark the special disadvantages of defendant's construction in this particular, as compared with the construction shown in the Liddell patent. The reasons for such disadvantage were

readily apparent on a moment's reflection, and the formulation and statement of such reasons in my answer to Q. 266 were purely my own.

x-Q. 310. Am I right in understanding that the foundation idea of the argument set forth in your answer to Q. 266, was first suggested to you by Mr. Ward, and that afterwards you consulted Mr. Lorenz about that subject, and in pursuance of that consultation he made Complainant's Exhibit Liddell Paper Bag Machine Forming-plates Showing Modified Positions of Trunnions, for the purpose of illustrating that argument? And that thereupon you formulated that argument in your answer to Q. 266?

A. The question does not correctly state the order of events in this connection.

x-Q. 311. It is true, is it not, that the argument in question originated with Mr. Ward? And that the making of the drawing to illustrate the argument was done by Mr. Lorenz, and that the formulation of the argument in reply to Q. 266 was done by you after Ward and Lorenz had made their contributions to the subject?

A. The facts are about as follows: At the time of making the models referred to, Mr. Ward, pointed out the disadvantage in defendant's machine of the nearer location of the pivotal axis to the forming-plate to the creasing edge of that plate than that shown in the Liddell patent. He did this in presence of counsel for complainant in presence of Mr. Lorenz and myself, though I believe he had previously mentioned it to me alone. The fact was at once recognized by all of us and, in considering my present deposition, it was determined by counsel to bring the fact out in my testimony. I did not request Mr. Lorenz to prepare the drawing in question and I do not know who did. It was ready for me when the question 266 was asked.

x-Q. 312. Did you consult with Lorenz before he made the drawing, upon the question as to how the drawing was to be made to illustrate the argument; or, was the outlining and making of the drawing the work of Mr. Lorenz alone?

A. I did not consult with Mr. Lorenz about the making of

the drawing, and in fact did not know such a drawing was to be made.

x-Q. 313. Did you do anything reliable toward verifying the correctness of the various positions which according to the drawing will be occupied by the plate E′ at the various stages of its folding operation, when that plate is pivoted at the three different locations shown in Figs. 1, 2 and 3 of the drawing respectively, or did you simply assume that the plate E when thus pivoted, respectively, would have the various positions shown in those figures respectively, without doing anything to verify those geometrical points yourself?

A. This question is evidently talking about something which has no existence outside counsel's imagination. There is nothing to verify in this drawing. The plate is simply shown starting from the same position, and stopped at the same outer angle with the periphery of the cylinder, giving the same conditions in all figures both for the reception of the blank and for the delivery of the diamond. If this is not obvious to the eye of defendant's counsel, I here furnish him with a piece of paper cut to the outer angle of the plate with the cylinder in its final position.

x-Q. 314. You never verified the last mentioned point until after you began answering the last question, did you?

A. I did.

x-Q. 315. Why then did you say in your last answer that there was nothing to verify on the drawing?

A. Because the drawing speaks for itself. Any man with a reasonably correct eye will see that these angles are the same, and because there is no fixed limitation imposd upon the length of swing of the forming plate, either by the Liddell Patent or by the mechanics of the case.

x-Q. 316. When I ask you in the course of this cross-examination, whether you have done or not done a particular thing, please to answer the question put, and please to refrain from arguing whether the particular thing inquired of needed to be done or did not need to be done. Now, please to state whether prior to presenting this blue print in your answer to Q. 266,

you ever did measure anything or any angle shown on that blue print?

A. With my eye I measured everything on the blue print, and took into account every essential fact, I believe.

[*Defendant's counsel objects to the answer because it assumes to judge what facts are essential and what are not essential, instead of confining itself to a plain statement of the single fact inquired of.*]

x-Q. 317. I am surprised that a mechanical engineer when under oath should talk about measuring the various parts of so complicated a drawing with his eye, and my inquiry had no such significance. Please to state whether at any time in your life before you presented this blue print in your answer to Q. 266, you measured anything or any angle or any curve, shown thereon, with any instrument whatever, or even with a bit of paper, or a bit of string. Now, please to answer this plain question and don't attempt to throw dust on the point by collateral observations.

A. Never since I was born had I made any measurements of the blue print referred to with any instrument, paper or string prior to my answer to Q. 266, and I should consider it a reflection upon me as an engineer to be asked to do so in view of its perfect obviousness in all particulars referred to in that answer.

x-Q. 318. It is true, is it not, that while you were answering x-Q. 313, you did do the disgraceful thing inquired of by cutting out a piece of paper to indicate the relative positions of the plate E and the cylinder C in the third position of that plate in Fig. 1, with the relative positions of the same parts in Fig. 2 and in Fig. 3, not being willing to trust your eye upon the proposition that the angle between the plate and the cylinder is the same in all three figures, and it is true, is it not, that you did this notwithstanding my request to you to refrain from measuring anything on the blue print until after you had answered that question?

A. I cut the paper, as stated, to verify the accuracy of my eye, and of my statement made to counsel while I was doing this, which statement counsel denied with the drawing before

him. As a matter of fact I did not lay that paper on more than one figure of the drawing before handing it to defendant's counsel, and I have never yet placed it on more than that one figure. Defendant's counsel applied it to the several figures of his copy of the drawing, and he has not since disputed the accuracy of my statement. I have just now for the first time applied that paper to the three figures of the drawing, with the result of finding my statement correct and undeniable.

x-Q. 319. It is true, is it not, that after you had pronounced your answer to x-Q. 313, down as far as to the words, "There is nothing to verify in this drawing," you left the room in search of an instrument by means of which to verify something in the drawing, and not finding that instrument you cut out a piece of paper to conform to the angle between the third position of the plate E and the cylinder in one figure and then applied that piece of paper to the corresponding angle in another figure before you proceeded any further with your answer to x-Q. 313, and you did all this against my objection and protest because my inquiry related to past verification or lack of verification, and did not ask you to engage in future verification.

A. It is only true that after failing to find a protractor in the office, I did cut the paper to the outer angle of one of the figures in the drawing, trimming it with a pair of scissors till I got it right, but after getting it of the right shape I did not go over the different figures of the drawings. It is possible that in trimming the paper I may not have laid it down on the same figure of the drawing, because I knew that they were all alike and it made no difference to which it was fitted, but beyond this I made no test of the fitness of the paper cut to all the figures of the drawing. I immediately handed it to defendant's counsel for his own use, which is the purpose for which I prepared it in the first place.

x-Q. 320. Do you mean to say that you prepared that paper for my use after I had protested against your doing it at all, and do you mean to say that you left this room and searched for a protractor against my protest for any other reason than to verify for your own satisfaction the angle made between the plate E in its last position and the cylinder C, and do you mean

to say that you interrupted this cross-examination against my strenuous objection from no other motive than to furnish information to me on a point upon which you were already certain, and do you mean to deny that while you were answering x-Q. 313, you were overtaken by a fear that I had found some error in the blue print, and did not dare to testify any further on the subject until you had procured or made an instrument by means of which to verify a point upon which at that time you were in doubt?

A. Barring all those parts of the questions which exaggerate the mild fact concerning counsel's alleged protest (which was no protest at all but was a mere request), I do mean to say that, after asking defendant's counsel if he had his protractor with him and being told that he had not, I went out of the room to get one, and finding none in the office, I cut the paper, I believed I knew just where counsel was lame in his inspection of the drawing, and I did expect the satisfaction of showing him to be in error, and he gave me the particular degree of satisfaction which I had not expected by replying to my statement to the effect that the outer angles were alike—that they were not, this little conversation occurring during the interruption and while I was cutting the paper. I mean to say further, that there was no "strenuous objection," and no objection at all, to the interruption of my answer to procure a protractor, and I further state that I was not overtaken by any fear that I had found an error in the blue print, and did not dare to testify any further until I had verified a point on which I was in doubt. The interruption in the answer. Q. 313, was after the word "same" before the words "outer angle" and it was made at that point because I hesitated whether I should say outer angle or inner angle, until I could get the instrument to make the measurement. I had thus committed myself before interrupting the answer, and further committed myself orally while cutting the paper in naming the outer angle, which statement counsel denied, as I expected he would.

x-Q. 321. It is true, is it not, that the pivot of the plate E is nearer to the edge of that plate in Fig. 1 of the blue print, than it is in the Liddell patent? So that it is really midway

between the place on the plate E to which the hook E is applied, and the edge W of that plate, instead of being exactly opposite to the shank of the plate E′ as in the Liddell patent?

A. If counsel will tell me how far the pivot of the plate E is away from the edge W of that plate in the Liddell patent, I will endeavor to tell him whether the pivot is nearer to the edge W in the blue print than it is in the patent.

x-Q. 322. In response to your invitation I will state that in the Liddell patent the pivot of the plate E is exactly opposite the shank of the hook E′, whereas, in Fig. 1 of the blue print the pivot of the plate E is about half an inch nearer to the edge of that plate than is the centre of the shank of the hook E′ and is about a quarter of an inch nearer to the edge of that plate than is the nearest side of the shank of the hook E′, so that the pivot of the plate E in Fig. 1 of the blue print, is somewhere midway between the shank of the hook E′ and the edge W of that plate; and I ask you to state whether I am right in the points of this question.

A. I get no enlightenment from the above in answer to my request for information. There is nothing in the patent stating the width of the plate E or the distance of the pivot from the edge W, and there is no specific position for the attachment of the hook E′ except that it should be sufficiently distant from the edge W of the plate to receive the paper under it. There is, therefore, no means of making a comparison by measurement in answer to x-Q. 321. But if counsel means to ask whether in the blue print the plate E extends beyond the pivot *e* and if in the Liddell patent it is not shown extending beyond the pivot, I reply that that is correct. I will add that with the pivot shown in the position of Fig. 1 of the blue print, the contrast between that figure and Figs. 2 and 3 is not so great and is, therefore, not so unfavorable to Figs. 2 and 3, as it would be if the pivot were situated at the extreme heel of the plate in said Fig. 1.

x-Q. 323. It is true, is it not, in Figs. 3 and 4 of the drawing, of the Liddell patent, the shank of the hook E′ is shown adjacent to the pivot upon which the plate E turns; whereas, in Fig. 1 of the blue print that pivot is not quite adjacent to that

shank, but is some distance nearer the edge W than is that shank, while in Fig. 2 of the blue print the pivot upon which the plate E turns, is still nearer to the edge W of that plate, than it is in Fig. 1; while in Fig. 3 the pivot upon which the plate E turns, is nearer still to the edge W. But in all three of the figures of the blue print, the pivot upon which the plate E turns, in those figures respectively, is nearer to the edge W of that plate than is the shank of the hook E'.

A. All that is true.

x-Q. 324. Now, Mr. Dayton, I believe that the whole argument which you inserted in the record in reply to Q. 266 is fallacious and invalid, because it takes into account only a part of the factors of the problem, and I am going to state the defendant's view of that subject and to ask you to point out any error which you can detect in my statement, as follows:

It is true that the plate E has less time for doing its work the nearer the axis of that plate is to the edge W, so that while in the apparatus of Fig. 1 of the blue print the plate has all the time from the numeral 4 to the numeral 15 in which to do its work; in theapparatus of Fig. 2 that plate must do its work in the time between the numeral 4 and the numeral 11, and in the apparatus of Fig. 3 it must do its work in the time between the numeral 4 and between the numeral 6 and the numeral 7 on the periphery of the cylinder C. The time allowed by the apparatus of Fig. 3 for the work of the plate E is too short for the purpose and that apparatus would not be preferred or be likely to be constructed by an expert in paper bag machinery. On the other hand the time allowed for the plate E in the apparatus of Fig. 1 is unnecessarily long, and that apparatus is objectionable because that unnecessarily long time can be attained only by an excessive amount of oscillation of the arm which carries the plate E, and which excessive amount of oscillation is indicated by the curved line which joins the two straight lines which converge in that figure in the shaft *f*. For these reasons the balance of desirability is attained by intermediate position for the axis of the plate E about where that axis is shown in Fig. 2 of the blue print; and the apparatus of

Fig. 2 is the best apparatus shown on the blue print. It is better than the apparatus of Fig. 3 because it allows more time for the plate E, and it is better than the apparatus of Fig. 1 because it requires only about half or two-thirds as much oscillation in the arm which carries the plate E as is required by the apparatus in Fig. 1, and the apparatus of Fig. 2, though it allows less time than the apparatus of Fig. 1 for the work of the plate E, allows time enough for that purpose. The fact that it allows time enough for that purpose is proved on theoretical and also on practical grounds. The theory which proves it, involves the proposition that paper can be folded with more accuracy and correctness at a medium speed than it can at a very low speed or at a very high speed. The fact which proves that a medium position for the axis of a tucker plate allows time enough for the tucker plate to work, consists of the fact that the tucker plates of the defendant's machine have their axes about midway between the shank of the hook and the defining edge of the plate, and the fact that those machines have been running for years at speeds as high as 164 bags per minute, making at present about 4,000,000 bags per day with a very small percentage of waste. The inferiority of the plan of Fig. 1 to that of Fig. 2, is indicated also not only by the theoretical matters I have mentioned, but also by the fact that no machine ever went into commercial use anywhere in the world having the pivot of its plate E even as near to the shank of the hook E′ as is shown in that figure, and no machine ever went into commercial use anywhere in the world which had the shank of the hook E′ adjacent to the pivot of the plate E.

Now, Mr. Dayton, I think that the defendant's view of this matter, includes all the facts upon which the argument which you made in your answer to Q. 266, is based, and goes still further into the question and shows conclusively that the defendant's machines are superior to the so-called Liddell machine in the only respect in which you claim, in this deposition, that the so-called Liddell machine is superior to the defendant's machine; which respect consists in the fact that the tucker plate of the defendant's machine turns on an axis midway between the shank of the hook E′ and the edge W, whereas,

in the so-called Liddell machines, the axis upon which the plate E turns, is adjacent to the shank of the hook E′. Please therefore to carefully review and consider all the statements made in this question, and then specify any error which you can detect among those statements, so that the court can judge whether the defendant's view of the matter is right or is wrong.

[*Objected to as containing mere assertion and alleged expert statement on the part of counsel, not a proper question in form, and as an effort to inject expert testimony on the part of the defendant in the record at complainant's expense and without cross-examination thereon.*]

[*Recess.*]

A. I do not feel called upon to make an answer which shall be held to recognize correctness in all statements of this 750 word question which I shall not specifically show to be erroneous. The first two sentences of the second paragraph of the question, down to the word "machinery," accords mainly with my own statement in answer to question 266, and, as to the second of these two sentences, I agree with defendant's counsel that the apparatus having the forming plate pivot so near the edge W as shown in Fig. 3 of the blue print, would not "be likely to be constructed by an expert in paper bag machinery," for that reason. And this statement of defendant's counsel clearly suggests his recognition of what I meant in a former answer by the words "within limits."

The third sentence of the second paragraph of the question contains the statement that "the time allowed for the plate E in the apparatus of Fig. 1 [of the blue print] is unnecessarily long." It is not said here to be *too* long, as it was of Fig. 3 that it is "*too* short," for the purpose. And it is not too long, nor can it be too long, since, the longer the time occupied by the plate in its forward swing in forming the diamond (measuring the time by an arc of the rotary cylinder) the more rapidly may the machine be run and the larger the output of the machine may be made. But, this third sentence of the second paragraph of the question goes on to say that the "apparatus of Fig. I is objectionable," because that unnecessarily long time

can be attained only by an excessive amount of oscillation of the arm which carries the plate E", the word "excessive" here meaning excessive range of oscillatory movement. And comparison is made in the same sentence with the arrangement of the pivot on the plate in Fig. 2. Here is a distinct fallacy in the statement of the question. The only objection to an oscillatory movement of anything is the difficulty encountered in stopping and starting the part moved, and this difficulty is augmented as the motion of the part is increased in speed between the terminals of its oscillation. It is not at all attended by difficulty as to the length of the movement itself one way or the other. Now, it is apparent that the longer the time allowed for the oscillation of the plate on its pivot (out of which oscillation arises the necessity for oscillating the arm carrying the pivot), the slower the movement of said arm may be and the less the difficulty from momentum and inertia in arresting and re-starting the arm at the terminals of its oscillation. And, moreover, the longer time afforded for the oscillation of the plate E, further permits the more gradual slowing down of the motion of the arm as it approaches the end of its throw, and the more gradual its acceleration in starting it back on its opposite throw. So, by reason of the high speed of the machine favored by the long time during which the plate E of Fig. 1 of the blue-print is occupied in its oscillation about its edge W, the more room there is for allowance to provide for such gradual slackening and acceleration of speed of the arm carrying the plate. Hence, that arrangement of the pivot of the plate E presents the most favorable conditions for the attainment of the best results in speed and output consistent with easy movements of the arms carrying the forming plate. In other words, there are the same reasons for regarding the arrangement shown in Fig. 1 of the blue print as better than the arrangement shown in Fig. 2, which the question gives in saying that the arrangement of Fig. 2 is better than that of Fig. 3, namely, "Because it allows more time for plate E" to make it swing.

The statement of the question that the apparatus of Fig. 2 is better than the apparatus of Fig. 1, because it requires only

about half or two-thirds as much oscillation in the arm which carries the plate as is required by the apparatus in Fig. 1, is doubly fallacious for two plain reasons, namely, first, it assumes that distance of oscillation is in itself objectionable, while, as I have shown above, it is only speed of oscillation that is objectionable; and, second, a shorter oscillation with a higher speed of oscillation involves the difficulty of affording minimum range of space and time in which to slow down to a stop and start up again to full speed the part being oscillated. These obvious facts, as I regard them, should make even more plain than I did in answer to Q. 266, the superiority of the construction shown in the Liddell Patent, and substantially represented in Fig. 1 of this blue print, over the construction in defendant's machine, which is rather worse than that indicated in Fig. 2 of the blue print.

I recognize the fact, learned in my own observation of paper bag machinery at work, that paper can be folded with more accuracy and correctness at a speed between the highest and the lowest possible, and, in accordance with this fact, both the machine of the Liddell Patent and defendant's machine will, in practice, be run at suitable speed of the forming plate, which, with the various end and tuck fingers, constitutes the principal diamond forming agency. And having shown in my former answer to Q. 266, that the forming plate or tucker of defendant's machines necessarily has a higher oscillatory speed for a given surface speed of the cylinder than has the forming-plate of the Liddell Patent drawings, it follows conclusively that defendant's machines are inferior to that of the Liddell Patent in this respect, it being observed that the surface speed of the cylinder determines the output of the machines in bags of given size per minute or hour.

This difference in the machines is the direct result of the difference in distance from the edge W of the pivotal axis of the forming-plates, and, considered from a mechanical standpoint, defendant's selection of a pivotal point nearer to the edge W of the Liddell plate E, appears to have grown out of the objectionability of a large radial movement of the so-called carriers, or sections of the cylinder periphery, which the plac-

ing of the pivot more remote from the axis of the plate would necessitate.

x-Q. 325. I can point out without the slightest delay that your last answer is entirely fallacious, and I will do so in the following terms:

While it is true that speed of oscillation is objectionable for the arm carrying the plate E, it is also true that distance of oscillation is objectionable independent of its speed. Speed of oscillation is objectionable because it increases the power needed to reverse the oscillation. Distance of oscillation is objectionable independent of speed, because it increases the steepness of the cam that causes the oscillation. The apparatus of Fig. 2 is superior to the apparatus of Fig. 1 of Complianant's Exhibits Liddell Paper Bag Machine Forming-plate Showing Modified Positions of Trunnions, in respect of speed of oscillation and also in respect of distance of oscillation. The fact that the distance of oscillation of the arm carrying the plate E is much greater in Fig. 1 than in Fig. 2 is obvious, and is admitted by you. The fact that the speed of oscillation of the apparatus of Fig. 1 is greater than the oscillation of the apparatus of Fig. 2, results from the fact that the distance of oscillation of the arm carrying the plate E in Fig. 1 is much greater than the distance of oscillation in the same arm in Fig. 2, and from the fact that the arm in Fig. 2 and the arm in Fig. 3 pass through their respective distances of oscillation with precisely the same frequency per second where the peripheral speed of the cylinder C is the same and where the number of bags made per minute or per second is the same. Thus, if the cylinder C of the apparatus of Fig. 1 and the cylinder C of the apparatus of Fig. 2 are exactly alike, in having four folding beds for each one, and if those two cylinders revolve exactly thirty times a minute, so as to make exactly 120 bag blanks a minute, the arm which carries the plate E in Fig. 1 must pass through its entire cycle of oscillations twice a second, and the arm which carries the plate E in Fig. 2 must pass through its entire cycle of oscillation exactly twice in each second. Now, inasmuch as the distance traversed by the arm which carries the plate E in Fig. 1 during one cycle of oscilla-

tion, is much greater than the distance traversed by the arm which carries the plate E in Fig. 2 during one cycle of oscillations, it follows that the arm of Fig. 1 must travel much faster during the half second necessary to complete that cycle than the arm of Fig. 2 needs to travel to cover the much shorter distances which constitutes its complete cycle of oscillations; the cycle of oscillations of the apparatus of the two figures being precisely alike in respect of the number, of oscillations which constitutes each cycle, but each oscillation in the cycle of the apparatus of Fig. 2 being less in range or distance than the corresponding oscillation in the cycle of the apparatus of Fig. 1.

Now, please to state precisely wherein, if at all, you can detect any error in the language of this paragraph?

A. The statements of the question are almost altogether erroneous, and if counsel has not already detected his own fundamental error (which I suspect is the case), he will recognize it at once when I point it out, as follows:

First, it is clear that the edge W of the forming-plate travels at the same speed with the surface of the cylinder, and in the two machines being compared this surface speed is the same.

Second, the longer the distance on the periphery of the cylinder through which the edge W of the forming-plate travels with it (in rocking from its starting to its finishing angle), the slower will be the rocking movement of said plate, and the longer the time in which it will be occupied in that movement.

Third, as the oscillatory movement of the arm carrying the pivot attends the rocking movement of the plate, throughout its extent, it follows that the longer the edge W rides on the surface of the cylinder, the longer will be the time occupied in the oscillations of the arms.

Fourth, wherefore, since the length of the time in which the edge W of the plate accompanies the cylinder depends on the distance of the pivot of the plate from its edge, the farther the pivot from the edge W the less rapid the oscillatory movements of the arms carrying said pivot.

Defendant's counsel has overlooked the fact that, in a four bag machine of Fig. 1 of the blue print, the forming-plate, being given a substantially equal rapidity in its back and forward motions, will occupy one-eighth of one rotation of the cylinder in its forward movement, less the time allowed for its period of rest, or, in other words, occupies, in both its backward and forward movements, one-quarter of one rotation of the cylinder, less its two periods of rest, in which may be included retardation and acceleration. The plate is traveling nearly all the time. In a four-bag machine, constructed in acordance with Fig. 2 of the blue print, the forming-plate having to travel just as fast, but not traveling so great a distance, is occupied in traveling a much less length of time and is at rest a correspondingly greater length of time. A machine corresponding with Fig. 3 would have a movement of the forming-plate at the same speed with the cylinder, but because it does not travel so far as the cylinder, it is occupied in its traveling motion a still less proportion of one-fourth of a revolution of the cylinder, and will be at rest a much larger proportion of the time in which the cylinder is making one-fourth of one revolution.

Wherefore, it does not follow that, because in each of the supposed four-bag machines, one set of movements of the plate and its supporting arm occurs for every one-fourth revolution of the cylinder, such movements are at the same rate of speed, as the question appears to suppose. The rate of speed of oscillation of the plate and of oscillation of the arms depends upon the distance which the edge of the plate and the cylinder travel together, with a modification of the factor of speed of oscillation of the arm effected by the length of such oscillation, of course.

The fact therefore remains, as I pointed out in my answer to x-Q. 266, that defendant's machines contain an embodiment of the Liddell invention inferior to that shown in the Liddell Patent, because, by reason of placing the pivotal axis of the forming-plate nearer to its creasing edge, defendant's forming-plate is occupied a less time in traveling and is a longer time at rest, in the formation of each bag.

x-Q. 326. In order to enable the court to easily judge which

of us is right upon this subject, I desire to ask you a few questions upon points about which it is impossible for us to differ. First, I inquire whether I am right in understanding that the pivot *e* of Fig. 1 passes through the following cycle of oscillation every half second, on the assumption that the cylinder C has four folding beds and makes two bag blanks a second. On that assumption the pivot or axis *e* starts from the lower position shown in Fig. 1 and rises to the upper position shown in Fig. 1, and then falls to the middle position shown in Fig. 1, and then rises to the upper position shown in Fig. 1, and then falls to the lower position shown in Fig. 1, and thus completes in one-half second of time a complete cycle of four oscillations.

A. It is a fact that these movements are, on the assumption of the question, made in *less* than one-half second, because the plate must occupy a position of rest (particularly in its starting position), long enough to receive a bag blank.

[*Adjourned to Thursday, December 10th, 1903, at 10:30 A. M.*]

Thursday, December 10, 1903, 10:30 A. M.

[*Met pursuant to adjournment.*]

Present—The Notary, and Counsel as before.

x-Q. 327. It is true, is it not, that the cycle of oscillation of the apparatus of Fig. 1, consists of four alternating movements and of four stops and reversals between those movements, and that the time occupied by the four alternating movements and the four stops and reversals, would be exactly one-half a second, on the assumption that the cylinder C has four folding beds and makes two bag blanks a second?

A. This is not a correct statement of the facts, because it does not recognise any period of rest which must occur after one stop, at least, in the correctly named cycle of movements. I refer to the period of rest which the forming-plate will have in its receiving position, shown in the solidly shaded or lowermost delineation of the forming-plate in which its edge W is directed to the left in the blue print.

x-Q. 328. It is true, is it not, that the apparatus of Fig. 1 and the apparatus of Fig. 2 are alike in that there must be the period of rest of which you speak in the receiving position of the plate E?

A. It is true that the two figures alike call for a period of rest of the forming-plate in its receiving position, but it is not true that they necessarily involve the same duration of that period of rest. In fact, if no period of rest is allowed to the plate at the end of its backward movement, and if it has the same speed forwardly as backwardly in each case, the period of rest in the apparatus of Fig. 2 must be much longer than that of the apparatus of Fig. 1, because its period of motion is much shorter.

x-Q. 329. I fear I must relinquish my hope of proving a few points in respect to the apparatus of Fig. 1 and Fig. 2 without the introduction by you of collateral and confusing matter in your answers, but before I entirely abandon that hope I inquire of you whether you are willing to answer one question after another exactly as it is put, and then stop talking until another question is asked?

A. I concluded counsel would relinquish this line of inquiry after a night's reflection, because, as he evidently sees, he is entirely wrong and I am entirely right.

I cannot promise how I will answer future questions further than to say I will promise to make them such as the court is likely to desire and approve. Counsel would better continue to ask his questions in his own way and let me answer them in my way.

x-Q. 330. It is true, is it not, that the following account is true of the apparatus of Fig. 1 and is also true of the apparatus of Fig. 2 of Complainant's Exhibit Liddell Paper Bag Machine Forming-plates Showing Modified Positions of Trunnions?

Assuming that the cylinder C has four folding beds and revolves thirty times a minute so as to make two blanks a second, and assuming that the plate E is in the very act of beginning to start forward from the lower position shown in each of those figures, the small shaft *e* rises from the lower position

shown in each figure to the upper position shown in each figure respectively, and then stops and rests and reverses its motion until it reaches the middle position shown in each of those figures respectively, and then stops and rests and reverses its motion until it reaches the upper position shown in each of those figures, and then stops and rests and reverses until it reaches the lower position shown in each of those figures respectively, and then stops and rests at the end of one cycle of oscillation, which cycle of oscillation, including four movements and four stops and four rests, and four reversals, has occupied exactly a half a second of time, and is immediately followed by an indefinite number of identical cycles of oscillation, each occupying a half a second of time as long as the machine runs at the rate of 120 blanks per minute.

A. The statement of the question is partly true and partly not true.

x-Q. 331. Wherein is the statement of the question erroneous?

A. It is erroneous in asserting a period of rest on the part of the pivotal shaft *e*, in its highest position at either of the two times at which it reaches that position. The first time it reaches that position it cannot have a period of rest if the edge W of the forming-plate rides on the cylinder or blank, although it will reach that position and start its descent from it very slowly. There *may* be given a period of rest to said shaft *e* the second time it rises to the highest position, but not necessarily so. Then, as to the intermediate position of the shaft to which it descends as the plate is carried farthest to the right, there also may or may not be given to said shaft a period of rest at this position. It is not a necessity. When I speak of a period of rest I do not mean the theoretical, infinitesimal incident to reversal, and I suppose the question does not refer to this either. The only necessary period of rest is in the receiving position of the forming-plate, which is the bottom position of said plate and its shaft in the blue print.

x-Q. 332. Are you still very sure in your own mind that you are perfectly right in respect of your answer to Q. 266 and in

respect of your answers to x-Q. 324 to x-Q. 331 inclusive; and is it still your opinion that it is practically important in a paper bag machine having such a forming-plate as that of the Liddell Patent to locate the pivotal shaft *c* adjacent to the hook E′ as is shown in the drawings of the Liddell Patent, instead of locating that pivotal shaft midway between the hook *c* and the edge W of the plate E, as is shown in Fig. 2 of "Complainant's Exhibit Liddell Paper Bag Machine Forming-plates Showing Modified Positions of Trunnions"? 1

A. I am very positive I was right in my answer to Q. 266. I have read over the questions and answers x-Q. 324 to x-Q. 331 inclusive, and I see nothing in those answers which I wish to change, although I can see that they might have been improved by more elaboration and by greater clearness of statement. It is still my opinion that the Liddell invention will be more advantageously embodied in a machine like that shown in Fig. 1 of the Liddell Patent wherein the pivotal axis of the forming-plate is made so remote from the creasing edge of that plate as to stand in the neighborhood of the base of the finger E′, or about opposite the end of the inserted blank, and wherein the pivot of the plate is carried by a movable arm from and toward the rotary bed, than in a machine like those of defendant, wherein the pivot of this plate E, is placed nearer the creasing edge W of said plate, and wherein said pivot is supported in stationary bearings, and sections of the cylinder periphery are made movable from and towards such stationary pivot. And I am still of the opinion that Fig. 1 of "Complainant's Exhibit Liddell Paper Bag Machine Forming-plates Showing Modified Positions of Trunnions" illustrates a better arrangement of the pivotal shaft *c* of the Liddell forming-plate than is shown in Fig. 2 of that exhibit. 1 1

x-Q. 333. Does the superiority of the apparatus of Fig. 1 over the apparatus of Fig. 2, amount in your judgment to a substantial difference, or is it simply and only a slight difference, of no practical importance in respect of utility?

A. The difference between Fig. 1 and Fig. 2 is obviously not a difference in principle, and is not "substantial" in the sense of making Fig. 2 a departure from the Liddell invention,

which is illustrated in the Liddell Patent more in accordance with Fig. 1 of the blue print. The difference is a mechanical one, wholly, but it is nevertheless, in my judgment, one which would be found of great practical importance in an actual machine, because it does not utilize the Liddell invention to the full advantage of which it is capable.

x-Q. 334. Is it your opinion that the apparatus of Fig. 3 is so far inferior to that of Fig. 2, that the difference between the apparatus of Fig. 3 and that of Fig. 1 is still more important than the difference between the apparatus in Fig. 1 and Fig. 2?

A. Fig. 3 of the blue print simply carries the mechanical error of Fig. 2 to a greater extreme than Fig. 2, and the deficiencies of such a machine would be so great, as compared with the excellencies of Fig. 1, that, as defendant's counsel has himself said, no engineer acquainted with the building of paper bag machines would be likely to adopt the arrangement shown in said Fig. 3.

x-Q. 335. I now call your attention to "Complainant's Exhibit Drawing Walker Model Room Machine Perspective Views," and I ask you to state whether you verified that blue print on the one hand, or whether, on the other hand, that blue print was made by Mr. Lorenz and agreed to by me as being correst as far as it goes, so as to obviate any necessitly for you to compare the blue print with the machine?

A. I was with Mr. Lorenz at the time he made sketches and took measurements for the preparation of this drawing and assisted him in some of the measurements. Besides, I also made one sketch myself, from the Walker Model Room Machine, at that time. While it was my purpose to verify the drawing by examining the machine with the drawing in hand, after its production, I treated the approval of defendant's counsel as relieving me of this necessity, and I accordingly have not directly compared the drawing with the machine. I have, however, seen the machine in operation upon an unpasted tube, and recognize in the drawing a correct representation of the mode of operation of the machine it purports in part to represent.

x-Q. 336. Am I right in understanding that the acting part

of the tucker plate of the Walker Model Room Machine extends from its working edge up as far as the vertical dotted line in Fig. 2 of the blue print; and that the further extension of that tucker plate is not any part of the tucker plate proper, but constitutes simply its attachment to the yoke or frame 300 which carries the tucker plate?

A. For operative purposes there is no objection to regarding the tucker plate as terminating with the dotted line which is near the fastening screws in Fig. 2.

x-Q. 337. Now, assuming the tucker plate to extend only to that dotted line, please to state whether I am right in saying that the trunnions upon which the tucker plate oscillates are midway between that dotted line and the working edge of the tucker plate, but are somewhat nearer to the working edge of the tucker plate than to the dotted line?

A. Measuring the width of the tucker plate from its working edge to the cross bar in Fig. 3 of this model room machine drawing (which figure gives the best attitude of the plate for measurement), said plate is twenty-two-eighths of an inch deep or long, and the axis of the plate is nine-eighths of an inch from its working edge, and therefore thirteen-eighths of an inch from the outer edge of the plate.

x-Q. 338. Now, please to look again at "Complainant's Exhibit Paper Bag Machine Forming-plate Showing Modified Positions of Trunnions," and state whether I am right in understanding that the axis of the tucker plate in the Walker Model Room Machine is relatively nearer to the edge of that tucker plate than in Fig. 2 of said Complainant's Exhibit, and is relatively further from the edge of that tucker plate than in Fig. 3 of that Complainant's Exhibit; so that if that Complainant's Exhibit were to have a fourth figure corresponding in respect of position of trunnions with the tucker plate in the Walker Model Room Machine, that fourth figure would show the trunnions of its tucker plate nearer to its edge W than in Fig. 2, but not so near as in Fig. 3.

A. I understand the word "relative" in the question, to point to the relation between the entire depth or length of the plate and the distance of the pivotal axis from the working

edge of the plate. Premising that the length of the plate, beyond the pivot, is entirely immaterial, and that the only vital condition is the actual distance of the pivot from the working edge of the plate, it is a fact that a fourth figure showing the *relative* position of the pivot to correspond with that of the Walker Model Room Machine, would show said pivot slightly more remote from the working edge of the plate than it is shown in the present Fig. 3, and considerably less remote from the working edge of the plate than is shown in Fig. 2. But the actual distance of the pivot from the working edge of the plate in the Walker Model Room Machine is an eighth of an inch less than shown in Fig. 3 of said blue print, that distance being nine-eighths of an inch in the Walker Model Room Machine and ten-eighths of an inch in Fig. 3 of the blue print.

[*Recess.*]

x-Q. 339. Please now to look at the paper bag which is in evidence in this case as Claussen Exhibit No. 7 and which is one of the bags made on one of the defendant's machines substantially like the Walker Model Room Machine, and please to recognize the fact that the transverse crease across the seamed side of the bag, immediately under the longitudinal centre of its bottom, is known in the art as the primary fold of the diamond, and is made by the edge of the tucker plate, and please to recognize the fact that that edge of the bottom which is nearest the mouth of the bag, is in the location of the fold first made in the diamond to form the first flap of the bottom, and is known in the art as the secondary fold. Now, having in view the exact character and location of the primary fold and the exact character and location of the secondary fold, please to state whether in the defendant's Walker Model Room Machine, that secondary fold is exactly coincident in location with the axis upon which the tucker plate of that machine oscillates when doing its work?

A. This question takes a round about way of asking if the axis of the tucker plate in the Walker Model Room Machine is not in line with the ends of the triangle folds in the sides of the diamond, at which ends of the triangles the flap folds are always made. That is the case. In other words, the axis of the

tucker plate in the Walker Model Room Machine is in line with that part of the diamond at which the secondary transverse fold is made, ultimately, in folding the flaps of the diamond and finishing the bag bottom.

x-Q. 340. It is true, is it not, that the distance from the primary crease to the secondary fold of Claussen Exhibit No. 7, is less, and must always be less, than the distance from the secondary fold to the end of the first flap, which in that exhibit is pasted under the second flap?

A. It is true that the distance referred to is as stated in the question, and that it is customarily true in bags of this description. I do not understand that it is an absolute necessity by any means.

x-Q. 341. The same thing is true, is it not, of Lorenz Exhibit No. 2 and Lorenz Exhibit No. 3, which two exhibits have been proved in this case to be specimens of the product of the old Lorenz & Honiss machine and of the old Stillwell machine respectively?

A. It is.

x-Q. 342. Now, suppose a Liddell machine were to be made with its tucker plate pivoted as in Fig. 2 of Complainant's Exhibit Liddell Paper Bag Machine Forming-plate Showing Modified Positions of Trunnions; that pivot would occupy a position more remote from the edge W of the plate than the location upon which the secondary fold would afterward be made?

A. Certainly it would.

x-Q. 343. Now, suppose a Liddell machine to be made with its tucker plate pivoted as in Fig. 3 of that exhibit, it is true, is it not, that in that case the pivot would occupy a position less remote from the edge W of the tucker plate than the location on which the secondary fold would afterward be made?

A. That is by no means certain, but it is possibly, and I may say, even probably true.

x-Q. 344. Now, it appears in Fig. 1 of the Liddell Patent, and still more clearly in Figs. 3 and 4, that in the drawings of that patent the axis of the tucker plate E is adjacent to the shank of the hook E', and therefore opposite to the forward edge of the upper ply of the bag blank; whereas, in the Walker Model

Room Machine the axis of the tucker plate is on a line with the secondary fold which is afterward made in the bag blank and the location of which secondary fold is midway between the forward edge of the bag blank and the primary fold thereof, though nearer to the primary fold than to the forward edge of the bag blank. Now, you have elaborately argued in your reply to Q. 266 and in your replies to x-Q. 324 to 331 inclusive, that the Liddell plan is much better than the Walker Model Room Machine on account of this difference; while the defendants take the ground that the Walker Model Room Machine is much better than the Liddell plan on account of this difference. I do not wish to debate that issue further with you in questions and answers but I want to be entirely fair to you and to give you an opportunity now to state your opinion concisely of the magnitude of the importance of that difference between the Liddell plan on the one hand and the Walker Model Room Machine on the other hand. You have already stated that in your opinion both plans are within the scope of the Liddell invention, and I am not asking you to withdraw or to reiterate that statement; what I do ask you is the question of the meritorious magnitude of the difference, regardless of any question of sameness or difference of principal.

A. The difference is one which, in my judgment, is important from a practical standpoint, for two reasons; first, and principally, because of its effect upon the working of the machine in the making of bags, and, secondly, because of its effect in the working and durability of the machine itself. To make the unfolding of the diamond twice or three times as quick as it need be, correspondingly increases the danger of tearing or wrinkling the paper, or, if the speed of the machine be regulated down to safety in this respect, the capacity of the machine is correspondingly reduced. That is to say, in a four-bag machine wherein a diamond is opened for every quarter revolution of the cylinder, it is better that one-eighth of the revolution of that cylinder shall be devoted to the forming of the diamond than that one-sixteenth or one-twenthy-fourth of a revolution of the cylinder be allowed for that purpose, and the remainder of the time available wasted in useless repose of the diamond-opening

plate. It is thus plain, as it seems to me, that defendant's machine, which, by reason of the location of the forming-plate pivot so much nearer to the creasing edge of the plate than is shown in the Liddell Patent, thus needlessly heightens the rotary speed of the forming-plate, shortens the period of forming the diamond, and imperils the paper or the product, is necessarily and to an important degree inferior to the construction shown in the said Liddell Patent.

As to the effect of the difference upon the working and durability of the machine itself, it is a well known principle in machine designing that unnecessarily high speeds of parts, and especially of parts which alternately move and rest, are objectionable, and are to be avoided where and as much as possible. In defendant's machine the forming-plate, while called upon to do its work and get back to its starting point only once in a quarter revolution of a four-bag cylinder, really does its work in forming the diamond so quickly and occupies so little time in getting back to its starting point, that it has a long period of rest at each end of its throw, both which periods of rest might better be abridged for the purpose of giving more time to the motions, with greater safety and durability to the parts of the machine concerned in such motions.

x-Q. 345. I call your attention again to the fact that in Fig. 1 of the Liddell Patent, and still more clearly in Figs. 3 and 4, of that patent, the axis of the tucker plate E is adjacent to the shank of the hook E′; and I ask you to state whether you know of any language in the Liddell Patent which either affirms or negatives the proposition, that that location of the axis *e* adjacent to the hook E′, was thought by the author of that patent to be essential to the plan of that patent? Please to answer this question without consulting the patent because I want to ascertain what knowledge you had upon the subject at the time I am putting this question.

A. I know of nothing in the Liddell Patent which makes that location of the forming-plate pivot essential.

x-Q. 346. Do you know of any statement in the Liddell Patent which makes that location non-essential?

A. The non-essentiality of that location is an obvious fact, and I do not recall that the Liddell Patent states such fact.

[*Defendant's counsel objects to the statement that the non-essentiality of that location is an obvious fact; because, the question is not asked the witness to make any statement on that point and because the non-essentiality of the location is not an obvious fact any more if so much as it is an obvious fiction.*]

x-Q. 347. Do you know of any statement in the Liddell Patent which expresses or implies the idea that the location shown in the drawings of the axis *c* being adjacent to the hook E′, is non-essential to the plan of the Liddell Patent?

A. I recall no direct statement expressly mentioning this matter in particular, but I do recall the fact that the Liddell Patent contains general statements as to the allowability of changes under the patent, which may cover this particular matter. And if I am allowed to refer to the Liddell Patent, I will indicate the statement or statements thereof which I have in mind.

x-Q. 348. Please to refer to the Liddell Patent and specify the particular lines of that patent which you have in mind; but please do not make any argument in response to this question, but confine yourself to giving the numbers of the lines to which you refer, as for example, as I suppose, lines 14 to 20 inclusive, at page 3?

A. I find on reading the patent that the statement I had in mind is that embraced in lines 14 to 20, page 3, but upon re-reading that statement, I find that it refers especially to the mechanisms for securing the several movements of the different parts, and would, therefore, not apply to the particular matter of relative positions of the plate pivot *c* and the hook E′. All that is said in the patent relative to conjunction of the two parts, to wit, pivot *c* and hook E′, is found at page 2 in the sentence beginning with line 50, which states that the finger E′ is "arranged adjacent to the axis *c* and below the forming-plate E″." The specification had previously referred to the fact that plate E is pivoted upon an axis at *c*, but had nowhere

specified any particular distance of that axis from the edge W of the plate. And nowhere else in the patent is it stated how far the axis *c* is, must, or may be, from the creasing edge W of the plate E. It is simply made plain that the plate has two axes, one, which is called its "own axis *c*," and the other the edge W. Having shown the axis *c* in a proper position for the best results, the statement quoted from the sentence beginning at line 50, of page 2, that the finger E' is "arranged adjacent to the axis *c*," does not appear to me as a restriction of said axis *c* to a position adjacent to the finger E', and I find nothing in the patent which expressly restricts or which expressly states non-restriction of the patent to any precise location of said axis *c*.

x-Q. 349. It is true, is it not, that in the Walker Model Room Machine the axis of the tucker plate is not adjacent to the finger, but is decidedly nearer to the working edge of the tucker plate opposite to the finger than it is to the edge which carries the finger?

A. In the Walker Model Room Machine the axis of the tucker plate is not adjacent to the *attachment* of the cylinder to the plate, and is only adjacent to that part of the finger which extends beyond it from its point of attachment toward the creasing edge of the plate.

x-Q. 350. It is true, is it not, that the Walker Model Room Machine would work as well as it does now, if the finger were a short clamp impinging upon the upper ply of the cut paper tube only at its end, like such a clamp, for example, as is shown in the Lorenz & Honiss patent, 337,956, as No. 84, and as doing the same work on the same kind of bag blank in that patent as is done by the finger 82b in the Walker Model Room Machine?

A. A clamping finger such as that shown in said Lorenz & Honiss patent, may undoubtedly be substituted for the finger of either the Liddell Patent or the Walker Model Room Machine, without impairing its efficiency.

x-Q. 351. If that substitution were made in the Liddell machine, that finger would be adjacent to the axis *c*, would it not? Whereas, if that substitution were made in the Walker Model Room Machine, that finger would not be adjacent to the

axis of the tucker plate of that machine? So that if the statement in the sentence beginning with line 50 at page 2 of the Liddell Patent is to be construed as a restriction, it would result that the Walker Model Room Machine with that Lorenz & Honiss finger, substituted for the present finger 82b of that machine, would be out of conformity to the Liddell Patent in that respect? Am I not right in this hypothetical statement?

A. Whether the finger in that case would be adjacent to the axis *c* in the Walker Model Room Machine, would depend on how long the finger was made. It might evidently be made so short as not to be literally adjacent to the axis of the plate. The pivot of the clamping finger would of course not be adjacent to the axis of that plate. So, if a pivoted clamping finger were applied to the forming-plate as shown in the Liddell Patent, the pivot of the clamping finger need not be adjacent to the axis of the plate, though the finger itself would reach into adjacency with the axis of the plate if the latter were retained in the position shown in the patent.

As to the other branch of the question, supposing the patent be restricted to the attachment of the finger to the plate at a point adjacent to the axis of the plate, it would not result that the Walker Model Room Machine with the Lorenz & Honiss finger, would be out of conformity with claims 1 and 7 of the Liddell Patent, because neither of these claims specifies the finger as an element. And as to claim 2 of the Liddell Patent, which specifies the finger only in these terms, "a finger moving with the forming-plate for receiving the upper sheet of the tube and lifting it during the formative action," the claim would be complied with if the finger were not attached to the forming-plate at all, but were supported by an entirely independent means, adapted only to move the finger with the forming-plate. This does not look to me like any intention to restrict the patent with respect to any exact point of attachment of the finger, and much less with respect to the location of the pivotal axis of the forming-plate at any particular distance from the working edge of that plate, concerning which the patent says absolutely nothing.

[*Adjourned to Friday, December 11, 1903, at 10:30 A. M.*]

Friday, December 11, 1903, 10:30 A. M.

[*Met pursuant to adjournment.*]

Present—The Notary, and Counsel as before.

x-Q. 352. I agree with you that the finger E′ is not an element in claim 1 or claim 7 of the Liddell Patent; and I go further and hold that that finger is not an indispensable element of the Liddell machine at 451 Washington street, though it is present in that machine; but I inquire of you whether I am not also right in holding that if that finger is employed and is attached to the tucker plate E it must be attached to that tucker plate in the particular position shown in the drawings of the Liddell Patent in order that it may impinge upon the centre of the forward end of the lower ply of the tucker paper tube.

A. It is only necessary that the finger shall stand in the position where it now stands, both in the Liddell Patent and in the Liddell machine—that is opposite the middle of the forming-plate—but it is not necessary that its connection with that plate shall be at any particular point. It may be supported from an arm which is attached at one side of the plate, and possibly at a distance from the axis of the plate. All these matters are mechanically altogether immaterial, because the finger acts in that part of it which extends centrally of and parallel with the plate, and not in that part of it which reaches into attachment with the plate.

x-Q. 353. I think you have in your last answer made a statement which you did not intend to make, when you said that the finger must stand opposite to the middle of the forming-plate, which would indicate that you meant to say that it must stand equally distant from the two sides of the forming-plate and half way between the edge W and the opposite edge of the forming-plate. Therefore, I inquire whether you did not mean to say that the finger must impinge upon the paper in the middle of that edge of the forming-plate which is opposite to the edge W?

A. I of course meant the transverse middle of the plate, that is, transversely of the machine and of the blank.

x-Q. 354. Your last answer refers equally to a dozen differ-

ent positions at least, because it equally covers any part of a zone extending longitudinally of the plate from edge to edge thereof, and refers to the transverse middle of the edge W as much as it does to the transverse middle of the opposite edge of the plate. Now, why not be precise upon this point and admit at once that when the finger E′ is used, it must impinge upon the paper at the middle of that edge or border of the forming-plate which is opposite to the edge W of the forming-plate?

A. This question, besides unfairly intimating an intention to be evasive, introduces an entirely new proposition or question. No one could misunderstand for a moment, at this stage of this testimony, what I meant by the middle position of the finger in my several answers this morning, and there is no reason why I should fail to make my meaning clear except that the plate can be considered as having a middle in two directions. Now the question talks about impingement of the finger upon the extreme end of the upper ply of the blank. This is not necessary. It may have no contact with the paper at all at that extreme edge, but may bear upon the paper a half an inch or an inch inward from that edge. If it be made in the form of a positively clamping clip, it will be more likely to clamp the paper against the forming-plate at a distance from the edge of that paper than at its edge. The essential function of the finger is to hold the middle of the end of the top ply of the blank extended in contact or proximity with the forming-plate, so that the middle of the upper ply, from its main transverse fold at the edge W of the plate to the end of the paper, will be kept substantially parallel with the forming-plate while the latter is being rocked on its edge W in forming the diamond.

x-Q. 355. Please to look at "Complainant's Exhibit Drawing Liddell Machine Parts Opening Diamond" and state whether the finger E′ is shown in Fig. 1 of that drawing in the location which it must occupy if it is to be used at all, and state whether that finger is shown in Fig. 2 of that drawing as impinging upon the middle of the forward end of the upper ply of the tucked paper tube so as to hold the middle of that upper end against that border of the plate E which is opposite to the edge W of that plate?

A. The finger is shown in its proper position opposite the middle of the plate, though not shown attached to anything, and it is shown holding the middle of the end of the upper ply of the tube in proximity to, but not necessarily "against," the adjacent border or margin of the forming-plate. As a matter of fact the finger in the machine represented in this blue print, stands away from the plate about three-sixteenths of an inch, and the paper bears against the finger instead of the plate, at and near the end of the ply.

x-Q. 356. Is that finger E′, shown in Fig. 2 of that Complainant's Exhibit, in substantially the position, relative to the paper, which it must occupy if it is to be used at all?

A. Understanding the "position" referred to in the question, to mean a middle position transversely of the plate, and on the opposite side of the paper from the plate (which is between the two), it does, of course.

x-Q. 357. That understanding is not a definite understanding of the position of the finger E′ as shown in Fig. 2 of the drawing, because the position of that finger in that drawing is not only a middle position transversely of the plate, but it is at one end or near one end of that middle position. Please therefore to state once for all, whether the finger E′, if it is to be used at all, must impinge upon the paper at or near the forward edge of the upper ply of the blank, as it is shown doing in Fig. 2 of the drawing.

A. That is true.

x-Q. 358. Now, it is not true that that particular position is adjacent to the places where the side fingers H H impinge upon the paper, and work above the tucker plate E in the drawing, and in the Liddell Patent, and in the Liddell machine at 451 Washington street?

A. A portion of the finger is about as nearly adjacent to the transverse line of contact of the side fingers with the paper as to the edge of the paper, but not quite, in the Exhibit drawing. This is merely a matter of length of the finger. In the patent, the finger is shown too short, and it is also shown shorter in the Exhibit Drawing, and is made shorter in the Exhibit Liddell machine, than such fingers usually are made; but,

whether long or short, the principal action of the finger in forming the diamond will be upon the paper at or near its end, and not necessarily at or near the transverse line of the side fingers, because these side fingers take care of the paper in their own neighborhood.

x-Q. 359. Mr. Dayton, I want to prove a few undeniable points of fact by you, and I must earnestly request you to refrain from making long, collateral arguments every time I ask you a question about what is shown or is not shown in a particular drawing. Please now to look at Figs. 5, 6, 7 and 8 of the drawings of the Liddell Patent, and state whether the finger E′ is shown in those figures in the place it must occupy if it is to be used at all, and also state whether that finger there shown is not plenty long enough to do its work, provided it has a clamping action like that of the finger 84, which is also shown to be short, and is shown to be doing the same work in the Lorenz & Honiss patent, 337,966, of March 16, 1886.

A. The finger E′ is shown, in Figs. 5, 6, 7 and 8 of the Liddell Patent drawings, in the transverse middle position it must occupy if used at all, and, if made to clamp the paper to the forming-plate, is long enough, or projects over the paper far enough, for this purpose.

x-Q. 360. It is true, is it not, that the finger E′ is shown in Figs. 5, 6, 7 and 8 of the drawings of the Liddell Patent, as being adjacent to that border of the forming-plate E which is opposite to the edge W thereof?

A. It is.

x-Q. 361. It is also true, is it not, that the fingers H of those figures, are nearer to the edge W of the forming-plate than they are to the opposite edge of the forming-plate?

A. That is true, also.

x-Q. 362. Please to call to mind November 16, 1903, when the so-called Liddell machine, at No. 451 Washington street, was run by Mr. Lorenz in your presence and in my presence, making several thousand good paper bags, and call to mind the fact that on that occasion I requested complainant's counsel to remove the flattening plate A from that machine, and then try to make paper bags with that machine without the flattening

plate, and call to mind the fact that complainant's counsel declined my request; and having called those matters to your mind, please to state in detail what consultation, if any, you thereafter had with anybody relevant to what action to take in respect of dispensing with the flattening plate, or in respect of substituting a different flattening-plate therefor, and trying to run the machine with that different flattening plate?

A. The only material fact that I recall in connection with anything in the nature of a consultation, is that I recommended taking the plate off and running the machine without it. But this was opposed on the obviously sound objection that you coupled your request with the demand that the blanks be run through the entire machine and the product saved. I saw at once this would be unfair and would open the door to easy misapprehension on the part of the Court, not to say misrepresentation on the part of the counsel, because, if the paper of the diamond were allowed to spring up, instead of being held down, on its way to the pasting and flap folding mechanism (which mechanisms require that the paper shall come to them in its proper diamond form), misshapen bags would result, and no just idea of the true work of the machine in its diamond forming mechanism could be had by the Court, while a chance would be afforded defendant's counsel for making any sort of contention he saw fit, as to the inefficiency of the diamond-forming mechanism. It was determined that after making a good diamond by the Liddell diamond forming mechanism of that machine, complainant had a right to retain that diamond in its proper form on its way to the pasting and flap-folding mechanisms, as all machines do, by a flattening plate or other device for the purpose.

x-Q. 363. Don't you know perfectly well, and as well as you know how to spell your own name, that the so-called Liddell Machine can never complete the folding of any diamond without a flattening plate such as the flattening-plate A or the flattening plate B, and don't you know perfectly well that either of those flattening plates in that machine first co-operates in the work of folding the diamond, and does not do anything fur-

ther than that co-operation toward holding down the diamond on the way to the pasting and flap-folding mechanism?

A. I know the very contrary, and if I chose to be as impolite and as offensive as defendant's counsel, I would say he knows it too.

There may be a difference between us as to what a "complete" diamond is. I regard a diamond as complete when the paper of the end of a tucked blank is opened out and re-folded into diamond form. The word "complete" does not, in my judgment, mean or imply that the new lines of flexure made in the paper in laying it in diamond form, are sharpened, broken down, or flattened, so as, of themselves, to retain the paper in its new positions, in opposition to its own resiliency. Said lines or flexure are never, in any machine, so flattened, sharpened or broken down by the diamond forming mechanism, and in no machine is the completed diamond, as produced by the diamond forming devices, allowed to move on from such devices to the pasting and flap-folding mechanism without either the breaking down of the folds or the holding down of the folds so that they shall not spring up and destroy the perfection of the diamond before the flap folds can be made.

There was at one time an impression in my own mind that the flattening plate A assisted slightly in the original formation of the diamond by contact of the angle of the plate with the edges of the inturned sides of the paper; but I was convinced that there was no material action of this sort by observing the operation of forming the diamond without any plate, and the conclusion was confirmed beyond all question by the use of the plate B, which is entirely destitute of that angle or bend in the plate.

x-Q. 364. It is true, is it not, that you never saw any paper bag machine make any such paper bags as these made by the so-called Liddell machine until September, 1903, and that you never yet saw any paper bag machine making any such paper bags except that you saw the old Lorenz & Honiss machines and the old Stillwell machine making similar bags in Sandy Hill, New York, in September, 1903, and that you saw the so-called Liddell Machine making those bags at 451 Washington

street, in November, 1903? And it is also true, is it not, that you never had the slightest knowledge of any paper bag machine or any patent for a paper bag machine for making such paper bags, except what you have acquired during your work in the present suit and in the sister suit against the Woodward & Rogers Company, and preparatory to the work you have done in those two suits as expert for the complainant? And it is also true, is it not, that you never have been trusted by Complainant's counsel to try to run any paper bag machine to make any paper bag, or to make any drawing or any model of any paper bag machine, or to do anything in connection with paper bag machines except to theorize and argue upon the patents submitted in your examination, and upon the so-called Liddell machine manufactured by William A. Lorenz, and upon various models made by Mr. Ward, and upon numerous blue prints made by Mr. Lorenz and put in evidence by Complainant's counsel while taking your direct-examination?

A. The statements in question are partly true and partly not true. It is not true that the Stilwell machines and the Lorenz & Honiss machine are the only ones which I have seen in the operation of making Deering bags, aside from the Liddell machine at 451 Washington street. It is not true, also, that I have "never had the slightest knowledge of any paper bag machine or any patent for a paper bag machine for making such paper bag except what you [I] have acquired during your [my] work in the present suit and in the sister suit against the Woodward & Rogers Company," although, if this were true, there has been ample time since my connection with this suit to have mastered the subject. And I am willing to say that my previous knowledge of paper bag manufacture and machines, was relatively slight, with the advantage, I think, of failing to learn so many things that are not so, as defendant's counsel appears to have learned in his boasted twenty years' connection with this particular art.

I am not asked, and have not been asked, to make drawings or models of any paper bag machine, probably because I am not in the field as a draughtsman or model maker, and possibly in part because my time costs more than does that of those who

are in that business. I have, however, been asked to direct the making of such drawings and models as I have thought desirable for my deposition, and have done so, and moreover, have been consulted in the construction of some of such models, and have directed such of their details as called for such direction. There has been no occasion to determine whether or not complainant's counsel would trust me to run any paper bag machine, because the mere control of the power lever on the one hand, or the scrutiny of the proper working of the parts of the machine while being run, on the other hand, are better done by those who make this their business, leaving me unembarrassed by such considerations in the study of the facts, and principles involved in the operation of the machine.

I believe it is true that I have been principally engaged by counsel to analyze and expound the machines shown and described in the various patents, blue prints, models, drawings and structures, which have been referred to, for which I believe myself to have been qualified by my general knowledge of mechanics, my mechanical training and the thirty years or more experience which I have had in just this sort of work.

[*Recess.*]

x-Q. 365. When and where did you ever see any machine making Deering bags other than the Stilwell machines and the Lorenz & Honiss machines at Sandy Hill, New York, and other than the so-called Liddell machine at 451 Washington street, New York?

A. In September last at Sandy Hill, New York.

x-Q. 366. What machine was that?

A. It was a machine invented, I believe, by a Mr. Dulin, and is spoken of as the Dulin machine.

x-Q. 367. In what factory or other place in Sandy Hill, New York, did you see that machine and those Stilwell machines and those Lorenz & Honiss machines in September, 1903?

A. In the factory of the Union Bag & Paper Company.

x-Q. 368. How long did you view those three kinds of machines in that factory? I gave about a half a day to the fac-

tory, a good share of the time to the inspection of the machines referred to.

x-Q. 369. How many Dulin machines did you see there that day?

A. One.

x-Q. 370. About how long a time did you give to the inspection of that one machine?

A. A very short time to that machine. It was out of order and not in regular running, but it was put through its motions for my benefit.

x-Q. 371. About how many Stilwell machines were running in that factory that day?

A. I could not say; a very large number.

x-Q. 372. Was it as many as 200?

A. There might have been, I can't say.

x-Q. 373. How many Lorenz & Honiss machines were running in that factory that day?

A. I can't state that any other of the particular group of Lorenz & Honiss machines than the one I particularly inspected, were running at all on that day. My impression is that there was a long row of such machines and one of them was run expressly for my examination in operation, after being handled or put through its motions by hand power for my deliberate inspection of it.

x-Q. 374. Was Mr. Lorenz with you that day?

A. He was not.

x-Q. 375. Was Mr. Stilwell with you that day?

A. He was not.

x-Q. 376. Was Mr. Chambers there that day?

A. He was.

x-Q. 377. Did you inspect more than one Lorenz & Honiss machine when running?

A. I did not.

x-Q. 378. Did you inspect more than one Stilwell machine when running?

A. I did, probably half a dozen or more.

x-Q. 379. It is true, is it not, that all the Lorenz & Honiss machines except the one you inspected were out of use on that day and not running at all?

A. That is true of the time I was there.

x-Q. 380. Now, please to state in hours or minutes as approximately as you can, how much time passed while you were examining that Lorenz & Honiss machine in that factory?

A. I kept no record of the time. I looked at it as long as I wanted to, with my knowledge of the patent under which it was principally constructed. I think perhaps I spent fifteen minutes or possibly twenty minutes, in looking at this particular machine.

x-Q. 381. State as approximately as convenient the length of time you occupied in inspecting Stilwell machines in that factory on that day?

A. I also kept no record of the time given to this particular machine, but should say it may have been about an hour.

x-Q. 382. It is true, is it not, that you never saw any paper bag machines running, making such bags as those made by the so-called Liddell machine at 451 Washington street, except those which you saw made on that machine at that place in November, 1903, and except those which you saw made in the factory of the Union Bag & Paper Company during an hour or two, or possibly half a day, when you visited that company in September, 1903, and which latter bags were made on one or another of the three kinds of machines you saw there?

A. This question gives me an opportunity to correct an answer I made to a former cross-question as to when I first saw the Liddell machine at 451 Washington street. I have been reminded of having seen that machine there and in operation on October 9th, 1903, as well as on November 5th, and on the day or so preceding November 5th, 1903, and later, as testified.

Answering the question and leaving out of account the fact that I saw paper bag machines running at Batavia, Illinois, fifteen or more years ago, in regular manufacture of bags (because I am unable to say now that those machines were making this particular kind of bag known as the Deering bag), I reply that it is true that I have only seen the 150 or so bag machines at work making the Deering bag which I saw at Sandy Hill in September, 1903.

x-Q. 383. Mr. Dayton, please pay attention to my questions

and answer them as they are put, and please to state whether you ever saw any paper bag machine making such bags as those made by the so-called Liddell machine at 451 Washington street, except those which you saw made on that machine at that place, and except those you saw made in the factory of the Union Bag & Paper Company during an hour or two or possibly half a day on the day you visited that factory in September, 1903?

A. I never saw any paper bag machines making such bags as those made by the so-called Liddell machine at 451 Washington street, except that machine and those machines which I have stated I saw at Sandy Hill, in September, 1903, leaving out of account those machines which I saw operating fifteen or more years ago at Batavia, Illinois, the nature of the product of which, as to the form of the bag bottom, I am not able now to state.

x-Q. 384. Do you really think your last answer is responsive to the last question?

A. I really do.

x-Q. 385. I will point out to you that it is not responsive to the last question, because, like the answer to x-Q. 382, it is consistent with the hypothesis that you might have seen the Deering bag made on the Sandy Hill machines every day for the last ten years, instead of being confined, as the question was, to a particular half day in September, 1903? Now, please to answer yes or no to this plain question. Did you ever see any paper bag machine making such paper bags as those made by the so-called Liddell machine at 451 Washington street, except those bags which you saw made on that machine at that place, and except those bags which you saw made in the factory of the Union Bag & Paper Campany in Sandy Hill, New York, during an hour or two or possibly half a day on the day you visited that factory in September, 1903, leaving out of account those Batavia machines, which, I may properly mention to you, are known to me not to have made any such bags as the Deering bag?

A. I think the difficulty grows out of the mixed-up form of the question, which really asks me if I ever saw any paper bag

machine * * * except certain bags, which is nonsense. I have tried to answer what I supposed counsel really meant to ask, and I try again by saying that I never saw the Deering bag made except during the half-day visit I made to the factory at Sandy Hill in September, 1903, and on the four or five occasions when I have seen them made by the Liddell machine at 451 Washington street, this city, in October, November, and December, inst. of this year.

x-Q. 386. During that visit at Sandy Hill, did you personally run any paper bag machine, or did you simply look on while somebody else managed the machines?

A. The machines were nearly all run by power, but as to the movements given them by hand, I did not turn the crank. I was busy watching the operation of the diamond-forming mechanisms.

x-Q. 387. Did you, in any case, start a fresh roll of paper running into a machine, or did you in any case shift a belt, so as to start or stop a machine, or did you do anything to influence any paper bag machine in any way, that day in that factory?

A. I did not. These operations seemed to be attended to satisfactorily by the cheap attendants, who paid no attention, apparently, as I did, to the principles of construction and operation of the machines in forming the diamond.

x-Q. 388. I now call your attention to Q. 248 in the deposition given by you before James J. Cosgrove, notary public, beginning November 6th, 1903, and to the request, which I inserted in the record immediately afterward, to be shown the machine to which that question referred, and which afterward turned out to be the so-called Liddell machine at 451 Washington street, and I also call your attention to the fact that after that request was denied, I requested to be shown that machine on the following day, at two o'clock in the afternoon, and that request was met by the statement from complainant's counsel that he could not be sure of arranging to run the machine the next day. And I also call your attention to the record of that deposition in the second paragraph under the head of November 10, 1903, wherein it appears that that ma-

chine was not shown to me on the previous Saturday, November 7th, or at any time prior to November 10th. Now, I ask you whether I am right in believing that the reason that machine was not shown to me on Saturday, November 7, consisted in the fact that I made the request only one day before and in the fact that complainant's counsel was not willing to trust you to run the machine for my inspection, but had to send to Hartford, Conn., to get Mr. Lorenz to come to New York to run it, and for some reason complainant's counsel could not get Mr. Lorenz to come to New York on that Saturday.

A. The running of that machine involves two things, first, the running of the electric generator and motor apparatus and, second, the running of the machine proper and the taking care of the bags produced. This requires the presence and attention of two men. Mr. Lorenz himself does not run the machine alone, in the sense of taking care of all these things, and he has Mr. Merritt with him, who, under the direction of Mr. Lorenz, manages the electric apparatus and assists in taking care of the bag product. Under these circumstances, I think it will be clear that there is no question one way or the other as to my being trustworthy for the purpose of running the machine, and I see no reason why counsel should have any such suspicion as that expressed in the conclusion of his question concerning complainant's counsel's motive in refusing the request of defendant's counsel to be shown the machine in operation without sufficient notice to enable Mr. Lorenz and Mr. Merritt to be present for that purpose. I happen to know that both these men were not available or in the city when the request of defendant's counsel was made.

x-Q. 389. Am I right in believing that the reason that machine was not shown to me on Saturday, November 7, consisted in the fact that I made the request only one day before and in the fact that the complainant's counsel was not willing to trust anybody except William A. Lorenz to run that machine and in the fact that Lorenz could not be brought from Hartford to New York on that day? Please to answer this question and refrain from making any argument with a view of trying to break the force of the fact.

A. What fact do you refer to?

x-Q. 390. Whatever fact is true on the point inquired of. Simply answer the question put, and refrain from arguing the case at large.

A. I don't know whether you are right in that belief or not. If counsel for complainant had any other reasons than those which he expressed on the record, he did not disclose them to me.

x-Q. 391. It is true, is it not, that machine never has been run making paper bags by anybody except Mr. Lorenz, and that he has been brought more than a hundred miles from Hartford, Connecticut, time after time during the last sixty days, at large expense, for the purpose of running that machine?

A. I do not *know* whether it is true, but believe it is, that Hartford, Conn., is more than one hundred miles from New York City; I do not *know* that Mr. Lorenz has always come to the city exclusively for the purpose of running that machine, when it has been run by him; and I do not *know* that his trips have been made here at "large expense." Nor do I know whether or not the machine has ever been run in making paper bags by anybody except Mr. Lorenz or by Mr. Lorenz and Mr. Merritt, but I think it probable that, it being a new machine with which Mr. Lorenz and Mr. Merritt, as constructors and operators, are perfectly familiar, it has so far been under their control when operated.

x-Q. 392. Is it possible for you to go into the best machine shop in the United States or any other machine shop you may select, and with the aid of the draughtsmen and mechanics to be found in that machine shop, is it possible for you to build and successfully run a paper bag machine made according to any one of the twenty-three self-opening square paper bag machine patents which have been offered in evidence in this case?

A. I have not tried it, but I think that is quite possible.

x-Q. 393. You never did at any time in your life, construct any paper bag machine or any other machine comparable in complexity to the so-called Liddell machine at 451 Washington street, and shown in Complainant's Exhibit Liddell Machine, Photo No. 1; did you?

A. I never built a paper bag machine, and I don't know that I ever built a machine of such complexity as that of the photo, taking in all its parts, albeit that is by no means an exceedingly complex machine when finally analyzed.

x-Q. 394. When last, if ever, did you build any machine whatever?

A. It is many years since, with my own hands, I have built a machine of any kind.

x-Q. 395. When last, if ever, did you build any machine by guiding, with drawings or other directions, the hand of mechanics and the other operations which were involved in putting the machine in the middle?

A. That also is a good many years ago.

x-Q. 396. How many years ago?

A. It must be twenty years or more ago.

x-Q. 397. Did you ever invent, design, construct or operate any paper bag machine whatever, or any kind of modern automatic machine, and if so, what kind?

A. I never have designed, constructed, or operated any paper bag machine, and I never have completed any invention in paper bag machines. I recently invented and patented an automatic friction draught gear for railway cars, the patent for which was issued to the Westinghouse Air Brake Company as assignee; prior to that I have not given any time to inventions for a good many years, and such inventions as I have made in the past have not been in the nature of what is called automatic machinery, which is ordinarily the devising and arrangement of mechanism for moving the active agencies of a machine in proper order, and is the lowest order of invention involved in the production of such machine. That is usually the occupation of a class of ingenious mechanics who run machine shops for the purpose of putting the generic inventions of others into concrete form.

x-Q. 398. I ought to indicate what I mean by modern automatic machinery. I mean, for example, such a machine as I know to have been invented, designed, and constructed by Edward E. Claussen, and which machine draws into itself at one end a long, continuous coil of wire, and manufactures that wire

into perfect machine screws, to be used in assembling sewing machines, typewriting machines, and other machines. And I mean, for example, such automatic machinery as is used in the Singer Sewing Machine Company for manufacturing and finishing every one of the small parts of every one of the several hundred kinds of sewing machines which are manufactured by the Singer Company, and I mean, for another example, any one of the several hundred of automatic machines which have been invented and patented by Francis H. Richard, and I mean, for another example, any one of the more than fifty automatic machines which have been invented and patented by William A. Lorenz, in a number of different complicated arts. And I mean, for still another example, such automatic machinery as is used at Elgin, Illinois, to manufacture the remarkably accurate and perfect watches which are made there. With this definition of what I mean by modern automatic machinery, I inquire whether you ever invented, designed, constructed, or used any modern automatic machines whatever?

A. I never have.

[*Adjourned to Monday, December 14, 1903, at 10:30 A. M.*]

Monday, December 14, 1903.

[*Met pursuant to adjournment.*]

Present—The Notary, and Counsel as before.

x-Q. 399. How long have you been a solicitor of patents?

A. I began my work in that line in 1871.

x-Q. 400. Have you been engaged in that business continuously during the thirty-two years which have passed since 1871?

A. I did little for the first few years, but, in 1877, began to devote myself exclusively to that work and to the work of testifying as an expert in patent suits as I was called upon in the latter capacity. My first expert case was in 1876, I believe, and my soliciting business was large until about 1895, when calls upon me for expert work in connection with patent suits became so great as to lead me to drop the soliciting of patents

except in an advisory capacity, and it has been almost exclusively in that advisory capacity that I have done any soliciting of patents since 1895.

x-Q. 401. It is true, is it not, that your work since 1876, has been exclusively as a patent expert, under which designation I mean to include the work of soliciting patents and also the work of comparing patents with each other and with existing mechanical structures with a view to consider their similarities and differences, but under which designation I do not include mechanical engineering, the latter profession relating, as I understand, to inventing, designing, or constructing machinery?

A. I do not understand that mechanical engineering has necessarily anything to do with inventing, or that it involves invention in any way whatever. A mechanical engineer is one who understands the principles of machinery, and, if he utilizes that knowledge in the occupation known generally as mechanical engineering, he may exclusively design machinery, he may both design and construct machinery, or he may be a critic of design and construction and an adviser of those who actually design and construct, without doing either. Mechanical engineers are often inventors also, but invention is no branch or part of mechanical engineering.

My work since 1876 has been continually the analysis and comparison of machines, the comparison of machines with patents, the definition of machines and inventions, in specifications and claims of patents, in depositions on the stand, or in opinions, with occasional inventions of my own, and such attention to actual constructions as has been principally called for by my connection with the manufacture of mechanical devices and machines.

x-Q. 402. According to your definition of "mechanical engineering," is a man a mechanical engineer who has an extensive theoretic knowledge of mechanics and who devotes his professional life to analysis, synthesis, comparison and criticism of the patents, plans, and machines of other men, without necessarily producing any patents, plans or machines himself?

A. I think that question is answered by the well known fact

that certain institutions of learning have graduated young men with the title and degree of mechanical engineer who have had opportunity, while acquiring such title and degree, to learn nothing but the principles of mechanics and machines theoretically, and without putting their hand to actual construction. The study of mechanical engineering will, however, anywhere involve mechanical drafting and designing of machinery, especially in illustration of acquired knowledge concerning strength of materials, proportions of parts, strains, and power. But it does not in any case involve invention, or patents, as distinct from machines themselves. People cannot be taught invention, and patents are directly related to inventions, as descriptions, by which particular inventions, set forth in the patents, may be distinguished from pre-existing machines.

x-Q. 403. Please to state whether a man can be a mechanical engineer who is a critic and adviser of others in mechanical matters, without producing anything himself?

A. Very easily, I think. Without being especially a producer myself, I have criticised the work of my clients and others, and have advised them to changes which have often been adopted as the practical form in which their inventions have been put upon the market and into use.

x-Q. 404. You have never yet testified in this case that you are yourself a mechanical engineer, and therefore your last answer seems to be merely argumentative, and as an argument it seems to lack the major premise. My object in this line of cross-examination is to place on the record some definite information about your professional scope. To that end please to state whether you are not what I may call a "wordist," rather than a machinist, and are not a critic rather than a constructor of machinery, and a describer and comparer of mechanism rather than being yourself a mechanician.

A. I am both a mechanician or practical mechanic and an analyst and critic of machinery. Besides being naturally a mechanic and readily apprehensive of mechanical constructions, I learned the machinist's trade in youth, though I personally attach no importance whatever to that fact. I do not think it has helped me at all in my work of studying, analyzing,

comparing, and describing machinery, which has been my occupation for so many years past. I have, indeed, found it advantageous sometimes to take hold of a tool and show another mechanic what I wanted done and how to do it, but I believe whatever success I have met with as a mechanical expert and solicitor of patents has resulted from a natural insight into machines and a ready apprehension of their essential principles, and, therefore, of the essential similarities and differences between machines being compared. To be a "wordist," as I understand the term to be used in the question, or, in other words, to be a "describer and comparer of mechanisms," means, if it means anything, to be first able to understand mechanisms, for after this the describing and comparing follow.

x-Q. 405. Were you ever a student in any institution of learning wherein you received any instruction in respect of any machinery, or in respect of either theoretical or practical mechanics or physics?

A. I studied the fundamental principles of mechanics in school, and afterwards taught them in school. I have been a student of machinery all my life.

x-Q. 406. When you began soliciting patents in 1871, your equipment for that work consisted essentially, did it not, in a mind which was uncommonly apt to learn mechanical facts, and did not include any important and considerable special training in anything which anybody could call mechanical engineering?

A. I did not call myself a mechanical engineer at that time, and would not expect anyone to call me a mechanical engineer. I had not taken a course of mechanical engineering in any institution, although familiar with machines and with the principles of mechanics. I commenced the soliciting of patents in connection wth certain inventions and new constructions in which I first took part as financial backer and mechanical advisor, but in which I presently became interested also as co-inventor, absolute designer and exclusive superintendent and director of construction.

x-Q. 407. Please to make your answer to x-Q. 406 to fit that question, without being too narrow or too large for that purpose.

A. I shall have to ask counsel what he means by the words "special training," if that be the part of the question which he thinks I have not properly answered.

[*Defendant's counsel states that mechanical engineering is an extensive art, which art requires for its practice an extensive knowledge in the science of mechanics; and that special training in mechanical engineering, means special instruction in that art and that science in some systematic way.*]

(Answer continued.) I had long before intended to take a course of study in the Troy Polytechnic Institute, and had studied under a mechanical engineer in preparation for entrance into that school, and had, in some directions, carried my studies beyond the requirement for such entrance, particularly in mechanical drafting and mathematics. But circumstances led me instead to change my plans and enter a classical college. My studies in mechanical engineering were systematic so far as they went, and were carried on under the guidance of a skilful and highly accomplished instructor; but they were not exhaustive.

x-Q. 408. Please to look at the answer of William A. Lorenz to Q. 2 of his deposition, on page 135 of the defendant's record, and state whether I am not right in understanding that your experience in anything that could possibly be called mechanical engineering or mechanical experting, does not appear to you to be very much less in magnitude and variety than that of Mr. Lorenz, and to include nothing whatever not included in his experience as set forth in that answer in his deposition.

A. If I could boast any qualifications superior to those of Mr. Lorenz, I would not do so, and I do not think I am called upon to make any comparison between my own qualifications and those of this or any other gentleman in my profession. My testimony must stand on my own record of experience as I have fairly stated it, and on its reasonableness. I did not work so long at the machinist's trade as did Mr. Lorenz, and I have not engaged in the business in which he was apparently engaged for many years, namely, the designing and construction of machinery, which business I understand he now carries on.

Nor have I made so many inventions or taken so many patents as he has made and taken in the course of his said business. I state simply that I have a natural aptitude for mechanics, have studied mechanical principals, have familiarity with machines, both in their construction and in their operation, and have for more than thirty years been directly concerned in the critical analysis and comparison of machines, and, as such a critic and analyst, I have been called upon to testify many hundreds of times in patent suits and to make hundreds of investigations and give hundreds of opinions outside such suits—such calls upon me increasing as time goes on. I have never offered myself as an inventor, but am naturally one. Accordingly my inventions have been such as were suggested to my mind in the study of particular machines, and have generally been in the nature of improvements on such machines. I envy Mr. Lorenz his experience, his record, and his ability; but I do not see that I am therefore discredited. Each of us necessarily stands on his own bottom.

x-Q. 409. Please to look at the answer of Wilbur M. Stone to Q2 of his deposition on page 181 of the defendant's record, and state how your experience in practical mechanical engineering in shops and factories, compares with that of Mr. Stone in respect of length, variety and magnitude?

A. I also decline to make any personal comparison between my own qualifications and those of Mr. Stone. I am ready to believe that Mr. Stone may have been a good machinist, a good draughtsman, a good advisory assistant for Mr. Francis H. Richards, and a good superintendent for the Pratt & Cady Company. I do not find that Mr. Stone claims to have had any experience, or any occasion for experience, in the analysis of machines, with a view to determining their fundamental principles or to the comparison of machines with each other as to their essentials, either for the purpose of defining the novelties of such machines in descriptions and claims of letters patent or in testimony for the guidance of courts in cases of infringement and anticipation of patents. He appears to have been largely experienced in connection with actual construction, but I believe he expressly disclaims possession of the in-

16 ventive faculty which, in my judgment, is a necessary accompaniment of the analytical faculty as applied to machinery. I should say from reading his general testimony, that, if left to form his own opinions, he might reach some that would be creditable and instructive.

x-Q. 410. How long a time did you occupy in reading the eight hundred and twenty-nine printed pages of defendant's testimony, and in studying the twenty-six patents offered in evidence by the defendant, and examining the many other exhibits of the defendant in this case, all of which work you say, in answer to Q. 245, you had done when you made that answer on November 6, 1903?

A. Before reading defendant's printed record and before
17 giving my testimony in the two opening cases, I had carefully studied all the patents set up in defendant's answers, and some additional patents, beside the patent in suit. I believe that occupied me something more than two weeks continuously. I subsequently gave them several days' further examination. The first reading of defendant's printed record, in connection with the paper exhibits of defendant, occupied me about three weeks, I think, and I have since given to that record and those exhibits additional time outside my work on the stand.

x-Q. 411. About how many thousands of dollars do your charges amount to thus far for the work you have done in this case and in the sister case against the Woodward & Rogers Company both of which cases are based upon the same Liddell
18 Patent, No. 558969?

[*Objected to as not proper cross-examination and unwarranted inquiry into the private affairs of the witness. Witness is instructed he need not give a mathematical or financial answer to the above question.*]

[*Defendant's counsel submits to the court that the witness ought to tell as near as he can how much money he has charged and has received or expects to receive for what he has thus far done in this case, because although an expert may properly receive more than a dollar and a half a day for his testimony, to be used as evidence in court, he may not properly*

conceal from the court the truth in respect of the amount of money paid or to be paid to him for his depositions.]

A. I have no objection whatever to answering the question, but I cannot do so exactly in the absence of my books. I should think I may have been paid between three and four thousand dollars up to date, in these cases. My rates are, and have for many years been, fifty dollars per day for work at my office, and sixty dollars per day plus expenses for work done elsewhere.

[*Recess.*]

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x-Q. 412. I think I detected a good deal of undeniable error in your direct-examination, and I inquire of you whether you will admit such an error when I point one of them out to you, or whether you will take some other course relevant thereto.

A. Most certainly I will admit it, and will be glad to have an opportunity of doing so, and of making the corrections.

x-Q. 413. Therefore, I call your attention to defendant's drawing No. 8, and particularly to Fig. 1 of the first column of that drawing, which figure is stated in the deposition of Mr. Stone (on page 215 of the defendant's record) to be from the Lorenz & Claussen patent No. 534,512; and I call your attention to that part of your direct-examination which is headed "Defendant's Drawing No. 8," where you say that the roller C of Fig. 1 of that column of defendant's drawing No. 8 is nowhere referred to in the Lorenz & Claussen patent as a bed; and I call your attention to the fact that that roller or cylinder C, is specifically designated as a folding bed, in claim 1 and also in claim 2, and also in claim 3 of that Lorenz & Claussen patent; and I ask you to admit at once that you were wrong in testifying that that part C is nowhere referred to as a bed in that patent.

A. What I said was that

> "Mr. Stilwell, who invented this type of machine, naturally knew what these rollers were for, and he states their character and purpose on page 2, lines 87, *et seq.* [of the Stilwell Patent, 417246]."

I also stated that the Lorenz & Claussen Patent was for an improvement of this type of Stilwell machine. I then said,

> "The lower roller G, answering to the roller C of Fig. 1 in the prior art column of Defendant's Drawing No. 8, is nowhere in the Stilwell Patent or in the Lorenz & Claussen Patent, referred to as a bed, though the Lorenz & Claussen Patent does call it a cylinder."

What I said was true of the description given in the Lorenz & Claussen Patent. That specification calls the cylinder 11 at least twice, a cylinder, and nowhere speaks of it as a bed or as a folding bed. Its first mention is at page 1, line 67, in these words:

> "The cylinder 11 and roll 12 are fixed," and so forth.

Again, at page 2, line 70:

> "A suitable length of tucked tubing is fed between the cylinder 11 and roll 12 * * *."

Claim 4 begins:

> "A cylinder 11 and roll 12 for bringing the blank into the machine."

In making the statement referred to in the question, I did not refer to the claims, but only to the specification, and I failed, therefore, to observe the fact that claims 1, 2 and 3 use the terms "a folding bed." These terms doubtless refer to the cylinder 11. I was, therefore, in error as to the fact of statement by the Lorenz & Claussen Patent. I was not, however, in error in saying that said cylinder 11 is not a folding bed. It is not such a bed and it is miscalled in claims 1, 2 and 3 of the patent.

x-Q. 414. You were in error, were you not, in testifying that that Lorenz & Claussen Patent nowhere referred to that cylinder 11 as a bed. Please to answer this exact question, and then I will show you that you are also in error in saying that that cylinder 11 is not a folding bed in point of fact. But first of all, I ask you either to admit or to deny, without trying to throw dust on the point by talking about the Stilwell Patent, that the Lorenz & Claussen Patent three times designates that cylinder 11 as a folding bed.

A. I admit that the Lorenz & Claussen Patent three times, to wit, in the first lines of claims 1, 2 and 3, and nowhere else, designates what it elsewhere calls the cylinder 11, a folding bed.

x-Q. 415. Please to admit or deny your error. I did not ask you to admit or deny the presence or absence of the term "folding bed" in the patent, because any man who can read can see that term in three places in the patent. I want you to admit or deny that you were mistaken on that subject in your direct-examination, and in pursuance of your promise in reply to x-Q. 412, I want you to admit or deny that error, and do it now.

A. That is precisely what I intended to admit and believe I have admitted, and admit again and will always admit. And that would have been my sole admission in the last answer, if counsel had not concluded his question with a final inquiry which I precisely answered in the belief that I was stating just what he wanted.

x-Q. 416. Now, I call your attention to another preliminary error of yours on this subject, which error consists in the fact that in part of your direct-examination under the head of Defendant's Drawing No. 8 you repeatedly and uniformly designate the part 11 of the Lorenz & Claussen Patent, as a feed roller; whereas, the Lorenz & Claussen Patent nowhere designates that part as a feed roller or as a roll, but designates it in at least seven places as the cylinder, or a cylinder; and I ask you to admit at once that it was not right for you to studiously and uniformly call that part a feed roller in face of the fact that the patent everywhere and often names it a cylinder, because that re-designation of the part by you with a new name never given to it in the patent, was calculated to mislead the court in respect of the character of the part 11.

A. I made no error in this particular, but counsel seems to have made the same error in his statement of fact in the question that I did before, for if he will look at claim 4 of the Lorenz & Claussen Patent, he will see it there stated that the cylinder 11 and roll 12 are for feeding or "bringing the blank into the machine." The word is "bringing"; the act is "feeding."

I justify the designation of the rolls 11 and 12 of the Lorenz & Claussen machine, as feeding rolls, because that is what their inventor, Stilwell, specifically called them in both Stilwell patents here in evidence.

In the Stilwell Patent 407794, the two feeding rolls are marked K and K′, and at page 2, line 115, they are designated as follows:

> "K K′ are feed-rollers, which deliver the blanks to the mechanism which opens and spreads out their bottoms * * *. The roller K′ [the lower roller], answering to what is called the cylinder 11 in the Lorenz & Claussen Patent] has a plain, cylindric face, as shown, while the roller K is made up of discs and does not touch the roller K′ at the center."

I believe K′ is only called a roller or a roll throughout this entire Stilwell Patent, and I observe that it is called "roll K′" in claims 10 and 11, and others, and "the feed roll K′" in claim 20.

In the Stilwell Patent, No. 417346, the same rolls or rollers are marked G and G′, G being the lower roller. At page 2, lines 87 to 90, these rollers are called "feeding rolls."

The character of these feeding rolls was not changed by the addition to the Stilwell machine of the improvement described in the Lorenz & Claussen Patent No. 534512, and it was therefore proper, as it seems to me, to give to said rolls or rollers the designation given them by their original inventor, which designation is in keeping with their actual character and function.

x-Q. 417. Please to listen to my view of this subject and state wherein if at all, I am wrong.

I was the patentee of the Lorenz & Claussen patent, 534,512, and presumably understand that patent thoroughly, and have done so ever since it was granted. The statement that the cylinder 11 and the roll 12 bring the blank into the machine, does not mean that they feed the blank into the machine. Quite otherwise than this, the patent states in lines 60 to 66 of page 1 thereof, that the blank is fed into the "herein described

mechanism" by any of the well known methods. Moreover, independent of this statement, the mechanism of the Lorenz & Claussen patent, 534,512, pre-supposes feeding rollers for feeding the blanks into that mechanism, and the parts 11 and 12 do not constitute feeding mechanism any more than the cylinder C of the Liddell patent constitutes a part of the feeding mechanism of that patent, which feeding mechanism is shown in Fig. 1 of that patent, to consist of the feed rollers D D, and which feed rollers, though not shown in the Lorenz & Claussen patent, are employed there and are expressly stated in that patent to be expected to be used therewith though the patent states that they are not shown therein.

Your argument that you feel justified in calling the parts 11 and 12 of the Lorenz & Claussen patent feed rollers, because they are called feed rollers in the two Stilwell patents, is invalid, because, the parts 11 and 12 are different from the parts you designate in the two Stilwell patents, and because the fact that you gave those parts a different name from that given in the patent in the Lorenz & Claussen patent, when you were speaking of the Lorenz & Claussen patent, is not justified by anything that Mr. Stilwell could have said or written in his patents which patents were issued years before the Lorenz & Claussen patent existed.

The difference between the first Stilwell patent and the Lorenz & Claussen patent on this subject, includes the fact that the parts K and K′ of the Stilwell patent, are comparatively small in diameter and of equal diameter, whereas, the parts 11 and 12 of the Claussen patent are distinctly and extensively unequal in diameter, the part 11 being very much larger than part 12, and the part 12 being quite as large as the part K or the part K 1 in the Stilwell patent.

Furthermore, the Lorenz & Claussen patent does not state or imply that its parts 11 and 12, are copied from any Stilwell patent.

For these reasons it was illegitimate for you to refer to either of the Stilwell patents, in response to an inquiry, which was confined to your error in designating a certain part in the Lorenz & Claussen patent as being a feed roller, in face of the

fact that that patent everywhere designates that part as being a cylinder or a folding bed, and plainly shows that it is not a feed roller by expressly stating that the blanks are fed into it by other mechanism not shown in the drawings.

A. The statement of counsel contains so many errors and fallacies that I am not sure I shall be able to point to them all.

First. That defendant's counsel was the patentee, or even the patent solicitor, of the Lorenz & Claussen patent, 534,512, by no means carries the presumption that he understands that patent thoroughly, or that he ever understood it, while the fact that he solicited the patent (if that be the case) might easily account for the confusion and conflict of its terms.

Second. The Lorenz & Claussen patent does not assert that the cylinder 11 and roll 12, bring the blank into the entering end of the machine, but must be understood to mean that they bring the blank into the diamond-forming part of the machine, and the fact that other feeding mechanism is elsewhere used, does not change the fact or contradict the statement of claim 4 of said patent, as to the bringing or feeding function of the cylinder 11 and roll 12.

Third. Counsel is in error in alleging in the question that there is any difference between the Stilwell patents and the Lorenz & Claussen patent, in any substantial degree, respecting the parts 11 and 12, as they are designated in the Lorenz & Claussen patent.

If the court will place side by side the rollers 11 and 12 as shown in the Claussen patent on sheet 5, Figs. 6 to 9 inclusive, and the rollers G G′ as shown either on sheet 5 (Fig. 12) or on sheet 8 (Fig. 22), of the Stilwell patent, 417,346, it will be seen that the rollers and cylinders correspond, practically, in their relative dimensions, and it is of these identical rollers G G′ of this Stilwell patent, that Mr. Stilwell says that they are "feed rolls." Besides, for a given sized bag, the lower roll or cylinder will have a definite diameter, while it is not material precisely what the diameter of the upper roll is. So there is absolutely nothing in this point of the question, and the exclusive reference of counsel to the other Stilwell patent,

where the upper roll happens to be shown of the same size as the lower one, without reference to the fact I have just mentioned and without reference to the second Stilwell patent, is calculated, it seems to me, to give a wrong impression.

Fourth. Counsel is only literally correct in saying that the Lorenz & Claussen patent does not state or imply that its parts 11 and 13 are *copied* from any Stilwell patent, the fact being that the Lorenz & Claussen patent, in express terms, refers to the Stilwell patent, No. 417,346, at page 1, lines 20 to 27, where it names that Stilwell patent and gives its date.

For the above reasons I think counsel in error in saying that it was illegitimate for me to refer to either of the Stilwell patents, and I believe I was right in designating the parts 11 and 12 of the Lorenz & Claussen patents as they were designated in the Stilwell patents from which they were borrowed.

x-Q. 418. Please to listen to the following view which I entertain of your last answer, and state wherein, if at all, you can detect any error in what I am about to suggest.

First. Your intimation that the Lorenz & Claussen Patent is characterized by confusion and conflict of terms and that that confusion and conflict may be accounted for on the hypothesis that I solicited that patent, was a double error on your part, because there is no conflict of or confusion of terms in the Lorenz & Claussen Patent and because it was solicited by William H. Honiss, who, when he solicited it, had ten years of active experience in inventing, designing, and building paper bag machines, and had several years of active experience in soliciting patents on paper bag machines.

Second. Your statement that the term "bringing the blank into the machine" is equivalent to feeding the blank into the machine, is entirely unsupported by argument or fact, and is contrary to the express statement of the Lorenz & Claussen patent that the blanks are to be fed into the machine by mechanism not shown.

Third. Your statement that there is no substantial difference between the parts 11 and 12 of the Lorenz & Claussen patent, and what Stilwell calls the feed rollers of this patent

is erroneous, because the part 11 of the Lorenz & Claussen Patent is large enough to have two folding beds thereon diametrically opposite each other when the bags are as short as some bags are made commercially, whereas, the first Stilwell Patent shows its lower roller only large enough for one folding bed, and though the lower roller of the second Stilwell Patent is somewhat larger than the lower roller of the first Stilwell Patent, it is not large enough for two folding beds upon its periphery.

Fourth. The Lorenz & Claussen Patent in lines 20 to 27, page 1 thereof, merely states that the Lorenz & Claussen invention refers to the same class of machines as the second Stilwell Patent, and it does not say or imply that it contains the same specific mechanism.

Fifth. The Lorenz & Claussen Patent shows that Lorenz & Claussen had knowledge of the second Stilwell Patent, 417346, and it also shows that Lorenz & Claussen did not agree with Stilwell in calling his parts G and G′ feed rollers, and on the contrary they took pains to state that in the Stilwell Patent, 417346, the tube is carried by a rotating carriage or cylinder, while the diamond-folding operations are being performed. When Lorenz & Claussen made that statement about the Stilwell machine, they were high experts in paper bag machinery, and knew what they were talking about.

Sixth. You might have been justified in giving to Stilwell's rollers the same name that he gave to them if you had been testifying about the Stilwell Patents or either of them, but you were not justified in giving the name "feeding roller," when you were testifying about the Lorenz & Claussen Patent, to a part which those inventors and experts always call a cylinder or a folding bed in that patent, particularly as they expressly indicate their opinion that the name was not appropriate even to the part to which Mr. Stilwell had several years before affixed that name.

Seventh. The cylinder 11 of the Lorenz & Claussen Patent is just as truly a cylinder and it just as truly contains a folding

bed as does the cylinder C of the Liddell patent in suit. The two rotating things are alike in having a cylindrical surface, and they are alike in that each of them has a front gripper indicated by the letter *c* in the Liddell Patent, and by the numeral 29 in the Lorenz & Claussen Patent, to clasp the forward end of a tucked paper tube and hold it down upon the surface of the cylinder; and also, they are alike in being provided with one or more pairs of side folding fingers adapted to be moved from and toward each other, which side folding fingers are indicated in the Liddell Patent by the letter G and in the Lorenz & Claussen Patent by the numerals 19 and 20, so that the cylinders in the two cases respectively clasp a tucked paper tube to their respective peripheries at exactly the same places by exactly the same instrumentalities, and on both cylinders move forward in the same way, and act, as they move, in the same way, to participate in opening out the forward end of the tucked paper tube from the original tucked form thereof toward a diamond form. The only difference between the two cylinders is that the Liddell cylinder is adapted to have two folding beds thereon, far enough apart to make a somewhat longer bag than could be made upon the two folding beds of the cylinder of the Lorenz & Claussen Patent. And the only difference between the grippers or fingers which work on the two cylinders respectively, resides in the fact that the front gripper 29 of the Lorenz & Claussen Patent, after doing a part of the work necessary to be done at that end of the bag blank, transfers its function to the guide plate 40, whereas the gripper *c* of the Liddell Patent continues to perform that function itself without making that transfer. But the first of these differences is only a difference in degree, and only a small difference at that, and the second of these differences is disavowed by the Liddell Patent as being essential to the Liddell invention, where in lines 58 to 62, on page 1 of that patent, it is explained that the front gripper or nipper *c* may be omitted entirely, and its function performed by other means, or words to that effect; and where the same explanation is substantially repeated in lines 128 to 134, inclusive, of page 2 of the patent.

[*Adjourned to Tuesday, December 15, 1903, at 10:30 A. M.*]

Tuesday, December 15, 1903, 10:30 A. M.

[*Met pursuant to adjournment.*]

Present—The Notary, and Counsel as before.

A. In answering this question, I do not wish to be understood as endorsing any statement in the question from which I may not specifically dissent.

Skipping the "First" allegation of the question, as calling for no further remark, I answer to the "Second" by bringing into juxtaposition the opening words of claim 4 of the Lorenz & Claussen patent, 534,512, and a corresponding statement in the Stilwell paten,t 417,346, both relating to the same thing.

The L. and C. claim says:

> "A cylinder 11 and the roll 12 for bringing the blank into the machine."

The Stilwell patent says (page 2, lines 87 to 90):

> "G′ and G2 [G] * * * are feeding-rolls through which the several blanks are fed to the mechanism *which opens their bottoms.*"

It is thus made certain, as it seems to me, that the words "bringing the blanks into the machine," of claim 4 of the L. and C. patent, are equivalent to "feeding the blank into the machine," in the sense of mechanism for forming the diamond. And this is not contrary to the express statement of the Lorenz & Claussen patent, elsewhere made, that "the blanks are to be fed into the machine by mechanism not shown" because the two statements are consistent as shown by the presence in the Stilwell patent from which the above quotation is made, of the mention, at page 2, line 44, of additional "feed rolls" C9 C9. A machine may, therefore, have more than one pair of feed rolls.

The "Third" proposition of the question is in fault in two particulars; first, in alleging a difference between the lower feed roll G of the second Stilwell patent No. 417,346, and the lower feed roll 11 of the Lorenz & Claussen patent, No. 534512; and, second, in alleging that the lower roll or cylinder 11 of the Lorenz & Claussen patent, is large enough to have two folding

beds thereon, (in contrast with the lower roller of the said second Stilwell patent) whereas, in the Stilwell machine, the lower feed roll G, whether with or without the Lorenz & Claussen improvement, is in practice made of a diameter suited to carry only one set of fingers, and is, in diameter, adapted to a particular size of bag to be made on the machine. The matter of diameter of this lower roll or cylinder is not immaterial, though probably variable within small limits, because the course of the upper ply of the bag blank must be such as to enable the tangentially descending tucker plate to strike it in a given position with respect to the fingers on the roll or cylinder. The upper ply is itself substantially a tangent to the cylinder, and to bring the intersection of two tangents into a certain definite relation to a point or to several points on the cylinder, requires that the cylinder have a certain curvature or, in other words, a certain diameter. It is for this reason, as I understand the matter, that all these Stilwell machines, both of the two Stilwell patents and of the Lorenz & Claussen patent, are shown with only one set of clips or fingers on the lower feed roll or cylinder by which the paper is fed, brought or delivered to the diamond-forming mechanism. And it is for the same reason that I have found in those Stilwell machines which I have seen in operation (and one or more of which I particularly examined on this point), that the lower feed roll or cylinder in question, varies in diameter with the size of the bag being made, and carries only one set of clips or fingers.

If this be correct, as I believe it is, the only case in which two oppoosite sets of clips or fingers could be applied to the lower feed roll or cylinder in question, would be in the manufacture of bags of much less than the usual length for a given width of the bottom.

I have paid no attention above to the use by counsel of the words "folding bed" in this "Third" clause of his question, because that subject is more especially considered in the "Seventh" clause of the question, which I shall presently reach.

As to the "Fourth" numbered clause of the question, I sim-

12 ply point to what the Lorenz & Claussen patent actually says at lines 20 to 27, page 1, and elsewhere, which is as follows:

> "The mechanism herein shown and described, represents this invention in its adaptation to that class of machines such as is shown and described in Letters Patent of the United States No. 417,346, of December 17, 1889; wherein the tube is carried by a rotating carriage or cylinder while the diamond-folding operations are being performed.

At page 1, line 35, this specification says:

> "Fig. 1 of the drawing of this specification, is a side elevation, partly in section on the line 1-1 of Fig. 2 of our
13 invention adapted to the *machine of patent 417,346*, above referred to * * * "

These statements of the Lorenz & Claussen patent, taken in connection with a comparison of the drawings of that patent with those representing corresponding parts in the Stilwell patent No. 417,346, clearly indicate, it seems to me, that counsel is in error in saying that the Lorenz & Claussen patent "merely states that the Lorenz & Claussen invention refers to "the same class of machines as the second Stilwell patent," and is further in error in declaring that said Lorenz & Claussen patent "does not say or imply that it contains the same "specific mechanism."

The "Fifth" clause of the question does not seem to call for
14 any special comment. Nor does the "Sixth" clause, in view of the comment called for by the "Seventh."

The "Seventh" clause of the present thousand word question, gives about four hundred words to what seems to me a very illogical attempt to show that the cylinder 11 of the Lorenz & Claussen patent contains a "folding bed," like that of the Liddell patent in suit. The reasoning appears to consist exclusively in pointing out that both are cylinders and that both carry end and side clips or fingers for engaging and holding thereto the lower ply of the paper tube. The similarities in these respects are indisputable, and if it followed that every cylinder which has such clips is a

folding bed or carries a folding bed, the conclusion would be sound. But that by no means follows, and all that is really left in this division of the question, is the bare assertion of counsel that the cylinder 11 of the Lorenz & Claussen patent, "just as truly contains a folding bed as does the cylinder C of the Liddell patent in suit."

Let us first see what constitutes the cylinder C of the Liddell patent a "folding bed," or a series of such beds, and then compare the cylinder 11 of the Lorenz & Claussen patent with said cylinder of the Liddell patent, and we shall reach the fact.

In the Liddell patent in suit, the diamond is formed and laid, in the first place, partly on the cylinder C and partly on the forming-plate E, the rear flap of said diamond passing off the forming-plate onto the cylinder immediately after the formation of the diamond, so that the whole diamond lies on the cylinder C in its passage through or to the subsequently acting, pasting, creasing and flap-folding mechanism. The diamond has thus its first full distention while lying on the cylinder or rotary bed C of the Liddell patent.

Now, turning to the Lorenz & Claussen patent, and particularly to Figs. 6, 7, 8 and 9, on sheet 5, of that patent, and it is evident that no part of the diamond is formed on the cylinder 11, and at no time lies or moves on said cylinder. The first or most advanced flap of the diamond, takes its form while passing in a vertical direction tangential to the cylinder and below the horizontal diameter of the latter after the paper has left the cylinder, as shown in Figs. 7, 8 and 9. The upper or second flap is formed in line with the lower flap and against the left hand or outer surface of the tucker plate 50, and when the diamond is completed, as approximately indicated in Fig. 9, it is wholly separated and removed from the cylinder 11, and does not rest on said cylinder at any point, as a bed. Indeed, the diamond is not absolutely completed until the extreme upper and rear point of the diamond stands opposite the horizontal diameter of the cylinder 11, and then this extreme point of the rear flap lies against the tucker plate 50, which is interposed between the diamond and the cylinder.

The real agency of the cylinder 11 of the Lorenz & Claussen

patent, (really, the lower "feed-roller G" of the Stilwell patent 417,346), in forming the diamond, as seen by Figs. 6, 7 and 8, of the patent drawing, is to deflect the lower ply downward for the purpose of causing it to leave the upper ply, or, in other words, to open the end of the bag blank and, by means of the side clips or fingers 19, to define the triangle folds in the side tucks of the diamond, while the latter is being extended by the stationary narrow guide plate 40, and the roll 37 and folding fingers 71. The side tuck fingers 19 on the cylinder would, as they had previously done, perform their function in connection with a horizontal carrier; but when a horizontal carrier had been used, other and special means had been used to open the end of the blank to receive the spreading agent. Hence, the distinctive function of the cylinder 11 is its deflection of the lower ply of the blank as a means of opening its end for the reception of the distending roller 37, and other distending means.

From the foregoing I think it is entirely clear that the cylinder 11 of the Lorenz & Claussen patent, although cylindric in form like the cylinder C of the Liddell patent, and although carrying fingers or clips like the cylinder C of the Liddell patent, does not, as counsel alleges in the question, "just as truly contain a *folding bed* as does the cylinder C of the Liddell patent in suit."

I wish to briefly recur to the second branch of the question, relating to the equivalency of "bringing" and "feeding" the blanks into the machine, as pointed out in the opening words of claim 4 of the Lorenz & Caussen patent, and in the several Stilwell patents on which the Lorenz & Claussen invention is specifically an improvement. I now point out that there are no "blanks" as distinguished from the continuous tube, until the paper approaches the cylinder 11 and roll 12 of the Lorenz & Claussen patent, and the corresponding "feed rollers" G and G′ or K and K′ of the two several Stilwell patents. Any preceding feed rollers acted upon the tube, and these feed rollers adjacent to the diamond forming mechanism are the first feeding rollers that act upon the separated blanks. The Stilwell patent, No. 407,794, says, at page 4, line 44, *et seq.*, "I have already pointed out how the tube is prepared and cut into blanks,

and, as the drawings show, *as soon as* the blanks are completely separated from each other, they pass between the rollers K K'." And by reference to Fig. 11 of the drawings of this Stilwell patent, and to the description of the final blank separators J J', just in front of the feed roller K. K', it will be seen that there is no other feeding device than the rollers K K', for carrying or bringing the separated "blanks" to the diamond-forming mechanism.

In the later Silwell patent, No. 417,346, the blanks are separated by means of a striker, accompanied by a slacking mecahnism which includes a pair of grippers consisting of projections F7 on opposing shafts F4, F5, which rotate and carry the projections forward as they clamp the tube at the moment the striker does its work, and said projections may be said to take part in moving the blank into the bite of the feed rolls G G'. The Lorenz & Claussen patent does not concern its f with anything in front of the rollers or the cylinder 11 and roll 12 which immediately deliver the just severed blank to the diamond forming mechanism.

There may, therefore, be a special propriety in calling the rollers referred to, feed rollers for the "blanks," as other similar devices are called feed rollers for the tube.

x-Q. 419. Please to look at Fig. 1 of the middle column of defendant's drawing No. 8, and state whether that figure properly represents the cylinder C of the Liddell patent in suit, with its appurtenant nippers *c* and side folding fingers G?

A. It does.

x-Q. 420. Does that Liddell Patent state or imply whether that cylinder, with its nippers and side-folding fingers, was old or was new at the time of the application for that patent?

A. I think the Liddell Patent does not anywhere say whether the cylinder C was old or not, in itself, and I believe it does not state or imply whether the cylinder with its nippers and fingers was old or new, except that it may be said to imply that they were not new in making no specific claim for novelty therefor.

x-Q. 421. It is true, is it not, that that rotating cylinder with its nippers and side-folding fingers are not claimed in the

Liddell Patent, except in combination with the forming-plate and other parts of a paper bag machine?

A. That is true, and is what I broadly stated in my last answer.

x-Q. 422. It is true, is it not, that Fig. 1 of the first column of Defendant's Drawing No. 8 conforms to the cylinder 11 and the front gripper 29 and the side grippers 19 and 20, of the Lorenz & Claussen Patent No. 534512, except that those parts are designated in that Fig. 1 by the letters C, *c*, G, instead of being designated by the numerals 11, 29, 19 and 20 respectively?

A. That is true, considering the figure with reference to the Lorenz & Claussen Patent, but it is not true, in my judgment, as placed in Defendant's Drawing No. 8 alongside the Liddell cylinder C and of the same size and bearing the same designating letters. What I mean is, that it conveys a wrong impression in the association given it in said Defendant's Drawing No. 8.

x-Q. 423. I take the ground that the cylinder C, with its appurtenant nippers and side-folding fingers of the Liddell Patent, was old at the time of the application for that patent, because those things were shown in the Lorenz & Claussen Patent 534512 of February 19, 1895; but I also think that the Liddell Patent shows those things in a substantially different environment from what accompanied them in the Lorenz & Claussen Patent, so that the plan of the Liddell Patent as defined in claims 1, 2 and 7 thereof, is on the whole substantially different from the plan of the Lorenz & Claussen Patent; and I ask you to state wherein if at all this opinion of mine is erroneous, in your judgment?

A. I think the question is in error in saying that the cylinder C, with its appurtenant nippers and side folding fingers of the Liddell Patent, was shown in the Lorenz & Claussen Patent 534512, because, though easily capable of being drawn to the same size in a picture, and there marked with the same letters, as has been done in Defendant's Drawing No. 8, so that they appear to be much alike, they are, nevertheless, really what they are in the several machines from which they are taken, and there

they are very different. That is to say, the cylinder C of the Liddell Patent, is one which is not only shown to have two sets of nippers and side fingers and to form two folding beds, but is, in the nature of the machine from which it is taken, capable of being made to have *any number* of folding beds and corresponding sets of nippers and fingers. In this respect the cylinder of the Lorenz & Claussen Patent is very different. It has no such capability of enlargement. It has a single central clip and a single pair of side-folding fingers, and if, by appropriating it to the manufacture of unusually short bags, it shall be possible to use two sheets of side fingers and two end clips (of which I am by no means certain), its capability of operative enlargement beyond this, is unquestionably impractical, and there is therefore a material difference between the two cylinders of the two machines, notwithstanding the picture representing them as similar in Defendant's Drawing No. 8.

x-Q. 424. I have a careful, geometric analysis of this subject, and I ask you to listen to my statement of that analysis, and point out wherein if at all it contains any error.

Lorenz Exhibit No. 1 is a bag of the Deering form, made on one of the Stilwell machines, and having the standard proportions of width of bottom to length of bag, those proportions being almost exactly three to one. That is to say, the lesser dimension of the bottom of this bag is three and three-eighths inches, while the length of the bag is about ten inches. In this bag the first of the final flaps is two and one-quarter inches long, so that that flap is approximately one-quarter the length of the bag back of the flap.

Now, coming to examine the drawings of the Liddell Patent with a protractor, I have found that the distance on the surface of the cylinder C, which is occupied by the paper which is afterwards folded into the first flap of the bag, is thirty degrees of the entire circumference of that cylinder. There being two such areas on that cylinder for its two folding beds, it follows that one hundred and eighty degrees of its periphery is allowed for each bag blank. Inasmuch as thirty degrees are required for the paper of the first flap, 120 degrees are required for the paper back of the first flap, making 150 degrees in all for

each bag blank, and leaving 30 degrees between the tail of one bag blank and the head of the next one following it, when the machine is used to make bags of the standard proportion.

Now, coming to examine the drawings of the Lorenz & Claussen Patent with a protractor, I find that the distance on the surface of the cylinder 11 which is afterwards folded into the first flap of the bag, is 40 degrees of the entire circumference of that cylinder, and that if two sets of nippers and side-folding fingers were to be placed on opposite sides of that cylinder, the paper of the first flap would occupy 40 degrees out of 180 degrees, and would leave only 140 degrees for that portion of the bag blank back of that first flap. Now, that 140 degrees is only three and a half times more than the 40 degrees occupied by the first flap, so that the resulting bag would only be three and a half times as long as the first flap, instead of being four times as long, as in the case of bags of the standard proportion; and as in the case of bags made on a cylinder having the proportions of the Liddell cylinder.

Now, coming to examine defendant's drawing No. 8, with a protractor, I find that this difference of proportion between the Liddell cylinder and the Lorenz & Claussen cylinder, has been increased in making that drawing, and is greater than is the corresponding difference between the drawings of the two patents themselves. On this point I find that the Fig. 1 of the middle column of Defendant's Drawing No. 8, agrees exactly with the Liddell patent, in showing thirty degrees to be the space allowed for the paper of the first final flap of the bag, but I also find that in Fig. 1 of the first column of Defendant's Drawing No. 8, the draughtsman allowed 45 degrees for the paper of the first flap of the completed bag, instead of 40 degrees as in the drawing of the Lorenz & Claussen patent from which that figure was taken. Thus, it has been demonstrated by me geometrically, that the draughtsman of Defendant's Drawing No. 8, instead of distorting the Lorenz & Claussen patent, so as to make it nearer like the Liddell patent than the two drawings would justify, did in fact exaggerate the only essential difference between the cylinder C and its appurtenances, of the Liddell patent, and the cylinder 11 and its appurte-

nances, of the Lorenz & Claussen patents, and which essential difference consists in the fact that the drawing of the Liddell patent gives only 30 degrees of the periphery of its cylinder C to the paper of the first flap of the bag, whereas, the drawing of the Lorenz & Claussen patent gives 40 degrees of the periphery of its cylinder 11, to the paper of the first flap of the bag made by that machine, and which difference is important in no respect except that the Liddell cylinder leaves 160 degrees for the rest of the bag blank, whereas, the Lorenz & Claussen cylinder leaves only 140 degrees to the rest of the bag blank, where the two cylinders are provided with two sets of nippers and side-folding fingers.

A. So far as the question seems to be readily intelligible to me, it appears to demonstrate that, even according to counsel's measurements, the Liddell patent drawings show the cylinder capable of forming two folding beds for two bags of usual length, and, therefore, appropriately shown with two sets of clips and side fingers, while the drawings of the Lorenz & Claussen patent do not show the cylinder large enough around to accommodate two successive bag blanks in one revolution, and, therefore, show it to be appropriately provided with only one set of clips.

Being asked to analyze counsel's analysis and to express my opinion as to its correctness, I wish to ask how he determines in the Liddell patent drawing, first, the distance occupied by the front or first flap.

[*Defendant's counsel states that he measured that distance on the surface of the cylinder from the place where the leading line of the letter c reaches the nipper c, to the place where the leading line from the letter* E *reaches the forming plat* E; *and that the first of these limits is obviously correct, because it implies the paper of the first flap is to pass forward under the nipper c far enough to be securely held thereby, without passing even as much as half way to the axis of that nipper, and that the second of these limits, though not obviously deducible from Fig. 1 of the drawings of the Liddell patent alone, is deducible from that drawing in connection with Figs 2, 3 and 4 thereof, and which deduction was reached by a careful consid-*

eration of the necessary position of the backward limit of the paper of the first flap when the fingers G are in their working positions as shown in Figs 2 and 4 of the Liddell Patent.]

[*Defendant's counsel adds that the drawings of the Liddell patent are on so small a scale and are in some respects so difficult to read that it is possible that the above deduction of the location of the rearward edge of the first flap is not quite correct, and that only 26 or 27 degrees of the surface of the cylinder will be occupied by the paper of the first flap, but if so, the point is immaterial, because even if 30 degrees are occupied by the first flap, the Liddell cylinder has room enough left for the body of the bag blank when it is provided with two folding beds.*]

(By the Witness.) I ask next how counsel determines the points indicating the limits of the first flap in the Lorenz & Claussen patent.

[*Defendant's counsel states that this ascertainment was easy, and is certain, and consists in measuring from the forward end of the lower ply of the paper bag blank in Fig. 6 of the Lorenz & Claussen drawing, to the nearest edge of the side-folding finger 19 thereof.*]

(By the Witness.) I next ask counsel how he determines the limits of the first flap in Fig. 1 of the prior art column, and in Fig. 1 of the Liddell column, in Defendant's Drawing No. 8, giving him the benefit of the suggestion that there is obviously nothing in either of those figures to indicate where the side-fingers intersect the edge of the tuck, which forms the limit of the front flap.

[*Defendant's counsel states that he ascertained those limits in both those figures by measuring from a point equally within the nipper c in the two cases respectively, to a point half way between the pivot and the point of the side-folding finger G respectively.*]

[*Defendant's counsel judges from the three questions put to him by the witness, that the witness had not given any geometrical attention to the subject before x-Q. 424 was put to*

him, and is, therefore, not fully equipped to answer that question; and for this reason the defendant's counsel withdraws x-Q. 424, and puts another question on another subject.]

x-Q. 425. Please to look at the Liddell patent No. 564,288, and state whether that patent shows the following subject matter.

"In a paper bag machine, the combination of a rotating cylinder provided with one or more pairs of side-folding fingers, adapted to be moved toward and from each other, a forming-plate also provided with side-forming fingers adapted to be moved toward or from each other, means for operating said fingers at definite times during the formative action upon the bag tube, operating means for the forming-plate, adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder, the whole operating for the purpose of opening out and forming the bottom of the bag tube, and means to move the bag tube with the cylinder."

[*Complainant's counsel objects to x-Q. 425 being put to the witness and answered by him until the witness has had an opportunity to complete his answer to x-Q. 424, and asks a ruling from the notary here present in charge of the taking of testimony, that the witness can proceed and finish his answer to x-Q. 424, in spite of the fact that defendant's counsel has on the record sought to withdraw that question before the answer was completed, as complainant's counsel is informed by the witness the answer was not finished by him.*]

[*The notary rules that the witness may proceed with his unfinished answer to x-Q. 424.*]

(A. to x-Q. 424 continued.) I am practically relieved from the necessity of saying that, in my opinion, counsel's alleged "careful geometric analysis of this subject" is incorrect, unreliable and worthless, by his admissions in response to my inquiries in the course of this answer. But as the nature and extent of his admissions may not be apparent to the court, I point out concerning his measurements on the Liddell Patent drawing, that the point forming the limit of the inner end of

the first flap, as fixed by him, is obviously too near the creasing edge of the forming-plate to be correct. I also point out that the other limit of said flap, as fixed by him, is obviously incorrect, because the point he names is over the hole in the cylinder, best seen in Figs. 2, 3 and 4, in which hole the clip works. The end of the paper is clamped by the clip *c* against the *cylinder,* and not against a *hole* in the cylinder. So much for the alleged "careful geometric" measurement of the Liddell Patent.

Next, as to counsel's measurement on the drawings of the Lorenz & Claussen Patent, which he says "was easy, and is certain," I pronounce it accurately impossible from the data counsel gives, and not at all certain, but mere guesswork. The end of the lower ply of the paper bag blank in Fig. 6 of the Lorenz & Claussen drawing does fix that end or limit of the flap, but "the nearest edge of the side-folding finger 19 thereof" does not fix the limiting point of the other end of said flap. There is nothing in said drawing to indicate how far this side of the cylinder shown in Fig. 6 the sectional line of the finger 19 is taken, but, by noting the width of the section and turning to Fig. 3 of the patent, it becomes evident that that section is at a distance outside the end of the cylinder. Now, as the finger is inclined, as shown in said Fig. 3, and as the edge of said finger which marks the limit of the inner end of the flap is specially inclined, it is evident that the flap will be longer than assumed by counsel in his question—the bag blank being of course proportionately longer than he assumed.

Counsel's statement concerning his "ascertainment" of the inner limit of the flap in the left hand and middle Figs. 1 of Defendant's Drawing No. 8, is on its face ridiculously uncertain and valueless, inasmuch as it consists simply in saying "a point half way between the pivot and the point of the finger G, respectively." By turning to Fig. 2 of the Liddell Patent and drawing two parallel lines, one through the axes of the fingers, and one through the points at which the fingers intersect the side edges of the blank (shown in dotted lines in that figure), it is clear that the last mentioned line, which forms the inner limit or end of the first flap, is only about half as far

from the pivots of the fingers, as it is from the points of those fingers. I do not think it worth while to make any investigation of the alleged measurements on the Lorenz & Claussen Fig. of that drawing, because it is evident that the whole proposition of the question, expressed with such apparent certainty, and with such show of knowledge and accuracy, is based on pure rule of thumb, and has no instructive value whatever.

Defendant's counsel states to the court that the geometrical analysis set forth in x-Q. 424 did not purport to be exact, because the limits of the paper of the first flap cannot be determined with exactness upon any of the drawings referred to in that question. And defendant's counsel also states that the answer of the witness, as far as it has gone, points out some respects in which the calculations stated in the question may properly be slightly changed in favor of the Liddell side of the account, but that that answer carefully omits to mention a respect in which the calculation may be changed in favor of the Lorenz & Claussen side of the account.]

[*Defendant's counsel adds that he is now convinced that if the calculations of the question were to be accurately corrected on both sides of the account, the very slight quantitative errors in the original calculation, would be found to nearly cancel each other, so as to leave the conclusion of the calculation nearly or quite unchanged, which conclusion was that the first flap of the bag blank occupies about ten degrees more of the periphery of the Lorenz & Claussen cylinder, than of the periphery of the Liddell cylinder, and that while the Liddell cylinder is large enough for two folding beds of an ordinary bag, the Lorenz & Claussen cylinder is not quite large enough for two such folding beds, though it is large enough for two folding beds for the manufacture of short bags.*]

x-Q. 426. Please now to answer x-Q. 425, the answer to which was postponed in pursuance of the ruling of the notary to give you an opportunity to complete your answer to x-Q. 424.

[*Adjourned to Wednesday, December 16, 1903, at 10:30 A. M.*]

Wednesday, December 16, 1903.

[*Met pursuant to adjournment.*]

Present—The Notary, and Counsel as before.

A. I recognize in the subject matter submitted in the question for comparison with the Liddell patent No. 264,288, the language of claim 1 of the Liddell patent in suit No. 558,969. The question is one to which I have not given consideration, although familiar with both these patents from my first acquaintance with either. It seems to me the statements of the two Liddell specifications are to be considered in determining this and similar questions, and from such examination of the specifications I am led to think that the two patents proposed to distinguish each other especially with respect to what may be expressed in the words "rotating cylinder" in the Liddell patent in suit and the claims, of which one is quoted in the question, on the one hand, and the words "rotary reciprocating cylinder" or "rotary reciprocating bed," as employed in the other Liddell patent No. 564,288. If this be true, then the patent 564,288 showing a rotary reciprocating cylinder or bed, would not present the "rotating cylinder" or rotating bed of the Liddell patent in suit, No. 558,969, and, of course, would not present a subject matter of its claim 1, quoted in the question.

x-Q. 427. Have you any definite opinion whether x-Q. 425 should be answered in the affirmative or should be answered in the negative?

A. No more definite opinion than that above expressed in my last answer.

x-Q. 428. Please to state whether the Liddell Patent 564288, shows a forming-plate provided with side forming fingers adapted to be moved toward or from each other, with means for operating said fingers at definite times during the formative action upon the bag tube, and with operating means for the forming-plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the forward rotary movement of said cylinder.

A. It does.

x-Q. 429. In many places in your present deposition, you have spoken of the forming-plate of the Liddell patent in suit

having an axis of support and an axis of work "remote" from each other, and you have pointed out that these two axes in the drawings of the Liddell patent are at opposite edges of the forming plate, and you have argued that while the axis of work must be at one edge of the forming-plate, the axis of support may be somewhere midway between the two edges of the forming-plate, provided it is "remote" from that edge which constitutes the axis of work. Now, as you know, the specification of the Liddell patent does not contain the word "remote" and does not use any language to convey the idea of that word in respect of the two axes of the forming-plate except where that patent explains that in the drawings thereof the axis of work is at the edge W, while the axis of support is adjacent to the finger E′, and which finger is necessarily remote from the edge W and is in fact at the opposite edge of the plate E, in the form of apparatus shown in drawings of the Liddell patent. Now, please to define without argument, your meaning in saying that the axis of support is necessarily remote from the axis of work, though not necessarily so remote as is shown in the drawing, and in this definement please to formulate and announce some rule or criterion by means of which I can know how near in your judgment the axis of support may be to the axis of work, and still be remote enough to embody what you claim is the essential principle of the forming plate of the Liddell patent in suit.

A. The specification of the Liddell patent clearly enough states that the forming plate E of that patent has two axes, one denominated in the patent as "its own axis *c*" (page 2, line 69) and the other, the working edge W of the plate, which acts "as an axis" in the forward movement of the cylinder and plate together when the diamond is being formed (page 2, line 70). The plate can not have two axes except they be separate or remote from each other, for if they be co-incident, they then become only one axis. As the edge W is necessarily one of the two axes of the plate, the other axis *c* must be remote from said edge W. Now, the question as to how remote the axis *c* may or must be from the edge W, is one with which the patent in suit does not deal. It simply shows the axis *c* situated at what I

think I have shown to be the most desirable position for successful, practical operation, while defendant's machine has shown that said axis *e* may be operatively situated less remotely from the edge W with a degree of practical success. The Claussen & Mortson patent No. 635090, mainly in accordance with which defendant's machines are constructed, shows the supporting axis *e* of the forming-plate in the position with reference to the edge W which it occupies in defendant's machine, said axis *e* being, in said Claussen & Mortson patent (see Figs. 18 and 19), shown co-incident with those ends of the triangle folds which lie on the forming plate and which mark the limit of the adjacent end flap of the diamond, and one edge of the bag bottom when completed. There is no practical reason why the axis *e* of the forming-plate may not be elsewhere situated, as for example, farther from the edge W of the plate than in defendant's machines, and in the Claussen & Mortson patent, but not so far from said edge W as shown in the Liddell patent. I am, therefore, of the opinion that the only "rule or criterion" for determining how near to or how far from the edge W the axis *e* may be placed while embodying the essential principle of the Liddell patent in suit is one of practical operativeness.

x-Q. 430. The prior art shows one or more instances of operative machines having oscillating plates doing the work of the forming-plate of the Liddell patent, in which the axis of work and the axis of support were co-incident; but those operative machines and their forming-plates operated, as I am willing to concede, under different principles from the Liddell forming-plate, and on a different principle from the forming-plate of the Walker Model Room Machine. For this reason, it seems to me that the test of practical operativeness is no test whatever by which to determine how little remoteness between the axis of work and the axis of support, is consistent with the principle of the Liddell forming-plate. I will therefore attempt to formulate a definition to express what your deposition appears to me to imply in respect of that subject, though the definition I will formulate does not represent my own opinion of the principle of the Liddell forming-plate. I therefore ask you whether your

view of that principle is not fairly and correctly definable as follows:

The principle of the Liddell forming-plate is present in any forming-plate which has an edge or axis of work moving forward upon the surface of a cylinder and at equal speed therewith, and has an axis of support which does not move forward as fast or as far as the axis of work, and which is located above the cylinder far enough to allow that part of the forming-plate which extends from the axis of support to the axis of work, to oscillate forward under the axis of support; room for which forward oscillation is obtained by an upward movement of the axis of support, as in the case of the drawings of the Liddell Patent, or by a downward movement of that section of the cylinder which is under the forming-plate, as in the case of Walker Model-Room Machine.

A. In saying in my last answer that practical operativeness would be the only rule or criterion for determining what would be a position, within the Liddell Patent principle, for the axis *c* as to its remoteness from the edge W, I of course meant practical operativeness in combination with a rotary bed or cylinder and the other elements of a practical rotary bed machine. I do not endorse the implication of the question that "the principle of the Liddell forming-plate" is identical with the principle of the Liddell *machine*, or the Liddell invention, of the patent in suit. It is true that the forming-plate of that invention is characteristically one which has two axes, one of work and the other of support, independent of the cylinder and remote from the axis of work. But, while this is requisite to the Liddell invention, it is not all of that invention. It is also a requisite or a vital part of the principle of the Liddell invention of the patent in suit, but not the entire principle of that invention. The definition suggested by counsel in the question is not in all respects correct or complete.

x-Q. 431. I have carefully studied everything you have said on this subject in all of your depositions in this case, and I framed the definition which I suggested in x-Q. 430, in exact accordance with what I understand to be implied in your testimony on this topic. But, now that you have stated that that

suggested definition is not in all respects correct or complete, I ask you to formulate a definition of the principle of the Liddell forming-plate, and to make that definition to express precisely your opinion upon that subject, after you have thus precisely formulated your view, I do not propose to proceed to any debate or cross-examination in respect of the correctness or incorrectness of your view, whatever it may be. But I do desire you to precisely define your understanding of the principle of the Liddell forming-plate, so that the court can be informed exactly what your opinion is upon that point.

A. Presuming that in repeating the terms "principle of the Liddell forming-plate" after the statement of my last answer, counsel means the principle of the invention or machine, I recall to his recollection the fact that I have repeatedly pointed out as characteristic of said Liddell invention, the continuous forward travel of the bed; the independence of the forming-plate of the bed; its permanent local position opposite the cylinder or continuously advancing bed, whereby one forming-plate may co-operate with any number of beds on the cylinder; the advancing movement of the working edge of the forming-plate with the bed or with the successive beds on the cylinder; the return movement of said working edge of the plate to its starting place, after each action in forming the diamond; the presence of a second and supporting axis of the plate, remote from the working edge of the plate, as a requisite to the foregoing; the provision of relative movement between such supporting axis and the surface of the cylinder, as a condition to the travel of the creasing edge of the plate with the cylinder and upon the blank from one inclination to the cylinder to an opposite inclination, necessary in forming and laying the diamond; the provision of side folding fingers on the plate and on the cylinder, to enter the tucks and to define the triangle folds in operating upon a tucked paper tube; means compatible with the foregoing for operating such side folding fingers, and mechanism for causing all the parts to co-operate at proper times for their co-action or for the co-action of the so mounted and moving forming-plate with each one of any number of successive beds present on the cylinder.

These are all principles of the Liddell invention and machine. Some of them may, perhaps, be said to belong to the forming-plate and others, perhaps, to the cylinder, but some of them are peculiar to the combination and are not assignable to any particular member of the machine, while none of them is independent of the complete combination. And this fact is not affected by the additional fact that the double axised forming-plate is also adapted for use in a reciprocatory machine, such as is shown in the Liddell Patent 564288. Such adaptation of the double axised plate only marks an essential difference between it and the older plate with a single axis, which was capable of use with a reciprocating bed, but was incapable of use with a continuously rotating cylinder or series of beds.

x-Q. 432. Your answer to x-Q. 431 appears to me to be a description, and not to be a definition at all. It appears in Defendant's Drawing No. 8, that the prior art contained a forming-plate substantially like the Liddell forming-plate except in having its axis of support and its axis of work co-incident and on the same edge of the forming-plate, instead of having those axes remote from each other and at opposite edges of the forming-plate. And it appears in the same drawing that the defendant's forming plate has its axis of work at the same edge as the Liddell forming-plate and as the prior art forming-plate, and has its axis of support midway between its two edges, but less remote from its axis of work than from the other edge of the forming-plate. It appears in the deposition of Mr. Stone that he thinks all three of these forming-plates are substantially different from each other; while it appears in your deposition that you think the Liddell forming-plate and the defendant's forming-plate are substantially alike, and are alike in being substantially different from the prior art forming-plate. Now, please to define that distinguishing characteristic of the Liddell forming-plate, which differentiates it from the prior art forming-plate, but in respect of which distinguishing characteristic the defendant's forming-plate is not differentiated from it, and please do not attempt to define this distinguishing char-

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acteristic by the use of the word "remote" or any other vague phraseology.

A. The last two sentences of my immediately preceding answer give the key to the answer to the present question. The prior art forming plate of Fig. 2, column 1 of Defendant's Drawing No. 8, having but a single axis, is capable of co-operation with a reciprocating folding bed only, while the double axised forming-plate of the middle or Liddell column of said drawing, and the double axised forming-plate of the third or defendant's machine column of that drawing, are capable of co-operation with a continuously rotating bed or cylinder. And these different adaptations for use precisely accord with the different uses to which said forming-plate are put in the several machines from which they are taken.

[*Recess.*]

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x-Q. 433. I am not yet able to detect any definition in your deliverances on this subject, and now I am going to try to develop the point in another way. To this end I call your attention to the Lorenz & Honiss patent, 337,966, from which was taken the prior art forming-plate of Fig. 2 of the prior art column of Defendant's Drawing No. 8, and I call your attention to the fact that though the working axis of that plate appears to be co-incident with its axis of support, in Fig. 5 of the drawings of that patent, that working axis appears in Fig. 9 of the drawings of that patent, to be somewhat removed from the axis of support, and in the opposite direction from the latter axis of the opposite edge of the forming plate. If you do not detect this fact in Fig. 9 with the naked eye, you can do so through the glass which I hand you and through which you will see that the horizontal lines which indicate the forming-plate 67 in that figure, are properly dotted lines, back of the bearing of the pivot 68, and those dotted lines extend fully one-eighth of an inch to the right of the centre of the pivot 68, and thus indicate that the working edge or axis of the forming-plate 67, is, on the scale of that drawing, one-eighth of an inch remote from the centre of the axis of support of that forming-plate. I also

call your attention to the fact that the folding bed under the forming-plate is designated by the numeral 47, and has a rising and falling motion somewhat like the rising and falling motion of the carrier or folding bed of the defendant's machine, so that the forming-plate 67 can turn upon its fixed axis of support when that forming-plate has its working edge somewhat remote from that axis, as indicated in Fig. 9 of the patent 337,966. Lest you misunderstand me on this subject, I will say at once that I believe the showing of Fig. 9 in respect of the working edge or axis of the forming-plate being an eighth of an inch away from the center of its axis of support, was an error of the draughtsman and was not intended by Lorenz & Honiss. But still that showing is there, and, it being there, I ask you wherein the forming-plate E of the Liddell patent differs in principle from the forming-plate 67 of that Lorenz & Honiss patent, on the assumption that the working edge of that forming-plate is one-eighth of an inch remote from the center of its axis of support, and on the assumption that its axis of support is somewhere midway between the working edge of that forming plate and the opposite edge thereof.

A. Counsel has fallen into an error in reading the drawings of the Lorenz & Honiss patent, 337,966, as he will readily see when I point to the fact that the plate, at its sides, is elongated beyond the creasing edge thereof, and fits into slots in the trunnions where it is riveted. This is clearly shown in the top view of Fig. 6, where only the creasing edge and the part of the plate adjacent thereto, is shown. Counsel will see from this figure that the actual working edge is in direct line with the axis of the trunnions or pivots 68. While the draughtsman might easily have made a mistake in the matter referred to, he appears to me not to have done so in either Figs. 8 or 9, wherein the dotted lines referred to in the question represent the prolonged sides of the forming-plate 67, where said sides are confined in the slots in the inner ends of the trunnion. In view of these facts I do not see that there is any question for me to answer.

x-Q. 434. There certainly is a question for you to answer, namely, the hypothetical question of the last sentence of x-Q.

433, which hypothetical question asks you to assume that the working edge of the forming-plate is one-eighth of an inch remote from the center of its axis of support in Fig. 9 of the Lorenz & Honiss patent, and then on the basis of that assumption, that question asks you to state wherein the forming-plate E of the Liddell patent would differ in principle from the forming-plate 67, on the Lorenz & Honiss patent?

A. Then the question becomes, as I understand it, a proposition to assume that the axis of the forming-plate 67, of the Lorenz & Honiss Patent No. 337966, is situated an eighth of an inch remote from the creasing edge of that plate, quite contrary to what is shown and described in said patent, and to state, on that baseless assumption, wherein the assumed or imaginary forming-plate of the Lorenz & Honiss Patent would differ in principle from the forming-plate E of the Liddell Patent in suit. The answer is that it would not differ in presenting two axes one remote from the other (stated in broad terms), but that it would differ materially from the forming-plate of the Liddell Patent in being inoperative and impractical in the combination in which it is shown. The machine of the Lorenz & Honiss Patent 337966 requires that the axis of support shall be coincident or identical with the axis of work, which is the creasing edge of the plate 67; the machine of the Liddell Patent, on the other hand, requires that the supporting axis of the plate shall be remote from the working axis or edge of plate, and sufficiently remote to give practical working results.

x-Q. 435. What is the essential function of the working edge or axis of work W of the Liddell forming-plate, and which essential function results from that axis being "remote" from the pivot or axis of support upon which that forming-plate oscillates?

A. The essential function of the working edge or axis of the forming-plate in the Liddell Patent, requiring remoteness of that edge from the axis *e*, is to travel with the advancing cylinder so as to do its work on the blank moving with said cylinder, while the plate is bodily retained in its local position, as distinguished from having a bodily travelling movement with the bed or cylinder surface.

x-Q. 436. Please to state in this place, for convenience, what work on the blank you refer to in your last answer as being performed by the edge W of the plate *e* upon the cylinder?

A. The work of defining the main transverse fold of the diamond, by serving as the thin, rigid body over which the paper is bent at that line of fold. To do this work and serve this purpose, it must preserve a substantially constant place on the blank during the folding operation, and, as the blank travels with the cylinder, this edge W of the plate must correspondingly travel with the cylinder and the blank.

x-Q. 437. Must that edge W travel forward with the cylinder adjacent to a definite line across the periphery of the cylinder, as the edge of the plate in Complainant's Exhibit Model from Fig. 1, Liddell Patent, travels forward adjacent to a particular tooth of the gear which in that model represents the cylinder?

A. I do not quite catch the point of this question if it is supposed to be illuminated by reference to the model referred to, which model lacks the cylinder; but it is true that the edge W must travel forward with the cylinder at the same speed as the surface of the cylinder, with possibly slight variation allowable in practice.

x-Q. 438. It is true, is it not, that according to the Liddell Patent, the edge W of the plate E moves forward from the position shown in Fig. 4 of that patent at almost or quite exactly the same speed as the surface of the cylinder below that edge, and thus moves through at least forty degrees of the revolution of the cylinder, and must not vary more than a small fraction of a degree from moving exactly with a line across the cylinder under that edge W throughout its entire movement of forty degrees.

A. The Liddell patent in suit unquestionably contemplates that the edge of the plate E shall move forward in forming the diamond at the same speed as the surface of the cylinder, or as a transverse line on the surface of that cylinder below that edge, with only an allowable variation of a slight amount from exactly the speed of that line on the cylinder. As to the distance of such co-equal and co-incident travel. I do not think

the patent is closely restricted, as to its principle, such distance of co-incident travel being doubtless variable within limits of practicability in forming and delivering the diamond. I should say that forty degrees of the circle of a two-bag cylinder would be in the neighborhood of what is necessary as a minimum, and that is about what is shown in Fig. 1 of the Liddell Patent drawings between the starting position and the dotted lines indicating an opposite position of the forming-plate, which dotted lines, however, are not intended, in my judgment, to indicate any precise angle or position of the forming-plate at the conclusion of its forward movement.

x-Q. 439. How many patents do you know of dated earlier than 1896, and showing paper bag machines for opening out one end of the tucked paper tube, from the form shown in Fig. 5 of the Liddell Patent in suit to the form shown in Fig. 8 of that patent, and which transaction constitutes the work which the machine of the Liddell Patent purports to perform?

A. Nineteen.

x-Q. 440. Have you carefully studied all of those nineteen patents so as to be able to stand a full cross-examination thereon, without further preparation than you now have?

A. I have carefully studied all of those nineteen patents and am ready to be cross-examined on them, but I shall have to refer to them in answering, of course, because I do not carry the details of every one of them constantly in mind.

x-Q. 441. Please to refer to claim 4 of the Lorenz & Honiss Patent, 337966, and state whether the language of that claim is not descriptive as far as it goes, of the forming-plate E of the Liddell Patent in suit, and its appurtenant side grippers and front gripper.

A. I do not think it is.

x-Q. 442. What word does that claim contain which does not fit the plate E and its side fingers H and front finger E'?

A. It isn't the fault of what the claim contains, but of what the claim does not contain. Perhaps this is what counsel meant to recognize in the use of the words "as far as it goes" in question x-Q. 441. If so, I should answer that former question by saying that, "as far as it goes,"

said claim does fit the forming-plate of the Liddell Patent in 17
suit and its appurtenant side grippers and front gripper.

x-Q. 443. What is your opinion upon the question whether a machine made in complete conformity to the Liddell Patent in suit, would contain an infringement of claim 4 of the Lorenz & Honiss patent, 337,966, in that its plate E and its appurtenant side fingers and front finger would conform substantially to claim 4 of that Lorenz & Honiss patent, though containing additional characteristics not called for by that claim?

A. I should say it might be held to infringe that claim.

x-Q. 444. Please now to look at the Patterson claim No. 446,839 of February 17, 1891, and state whether it shows a plate G, which has an axis of support remote from its working edge, and which working edge does precisely the same work 138
in defining the transverse fold of the diamond that is done by the edge W of the plate E of the Liddell Patent in suit? I do not inquire whether the plate G of Patterson and the axis of support upon which it turns, are identical in form with the plate E of Liddell, for they obviously are not alike in that respect; but I do inquire whether they do not each of them have a working edge which does exactly the work of the edge W of the plate E of Liddell, and do not also each of them have an axis of support upon which they oscillate respectively and which axis of support, in each case, is remote from the working edge of the two plates respectively?

A. There is no correspondence whatever in the mounting or movements of the two plates inquired about in the question. 138
The plate G of the Patterson patent, is essentially a longitudinally and horizontally reciprocating plate, and has no vibratory or oscillatory movement whatever on its edge, as does the plate E of the Liddell Patent in suit. Its course, out of its range or field of work, is curved above the path of the blanks because the inventor has chosen to support it from the end of an arm of considerable length pivoted at a considerable height above the path of the blank, and the plate is given the large curvature of its longitudinal reciprocatory path, which path correspondingly varies from an actual horizontal. It is only by the purest literalism and most extreme disregard of structural

facts and operation, that the terms of the question can be applied to both the plate G of the Patterson patent and the plate E of the Liddell Patent in suit. Possibly in this unnatural manner, such words of the question may be so literally applied, but if so, they indicate no actual correspondence or identity, outside their express reference to the working edge of the plate, which, in all plates for defining the main transverse fold of a diamond, have a correspondence in function.

x-Q. 445. The Patterson patent, 446,839, of Feby. 17, 1891, shows the first instance that I have been able to find in this art of self-opening square paper bag machines, of a plate having an edge to define the primary transverse fold which is made across the upper ply of a tucked paper tube (as the edge W of the plate E is shown doing in Figs. 6, 7 and 8 of the Liddell Patent), and oscillating upon an axis of support remote from that defining edge. I agree with you that the forming-plate of the Liddell Patent is substantially different in character and mode of operation from that plate of the older Patterson patent; but I call your attention to the fact that the plate E of the Liddell Patent cannot be differentiated from the plate G of the Patterson patent by a definement such as you have given to the plate E of the Liddell Patent throughout your deposition by implication, and which definement consists in specifying remoteness between the edge W and the pivot *c* of the Liddell Patent, of the plate E of the Liddell Patent, as constituting the distinguishing characteristics of that plate, and which definement appears to have been adopted by you in order to bring the tucker plate of the defendant's machine within it. With this explanation of how your testimony on this subject has impressed me thus far, I now give you an opportunity to somehow define the forming plate of the Liddell Patent in terms which will differentiate it from the plate G of the Patterson patent, but not differentiate it from the tucker plate of the defendant's machine; as it is obvious you have not accomplished that result by your doctrine of "remoteness," which doctrine is absent from the Liddell Patent, but which everywhere pervades your testimony upon the subject of the con-

struction of the Liddell Patent, and upon the question whether the defendant's machine infringes that patent.

[*Adjourned to Thursday, December 17, 1903, at 10:30 A. M.*]

Thursday, December 17, 1903, 10:30 A. M.

[*Met pursuant to adjournment.*]

Present—The Notary, and Counsel as before.

A. If you take your pencil out of your pocket, hold it vertically with its point on the table and its upper end under your finger, and move your finger back and forth, you will rock the pencil on its point and also at its upper end. In its relation to the table and your finger, it is a sort of double-jointed member, having one of its joints or axes where it rests on the table and the other where it connects with the finger. Now, take a garden hoe in the hand and swing it, say, from the shoulder joint, as in striking its blade into the ground. There is one pivotal axis only in this case, namely, at the shoulder joint about which the handle of a hoe swings or vibrates. The blade of the hoe moves practically in its own plane, and it has no pivotal connection with or bearing upon anything else whatever. These rude illustrations indicate one fundamental distinction between the forming-plate E of the Liddell Patent in suit and the hoe-like tucker plate G of the Patterson patent.

But this is not all the difference between the two devices, though it lies at the bottom of the possibility of difference in other respects. In the rocking movement of the forming-plate E of the Liddell Patent, it starts from a position substantially parallel with the end of the bag blank which is to be opened out into a diamond, and, being provided with side fingers which enter the side tucks of the blank, it engages itself with the upper ply of that end of the blank. Then, as it rises in its rocking movement on its axis at its creasing edge, it lifts that end of the upper ply which it has seized by means of its fingers, and begins the folding of that upper ply about the creasing edge of the plate. The plate is held from bodily advancing move-

ment at its upper axis, and its lower axis or edge advances with the bed and blank with the result of carrying the edge beyond the upper axis, and to a position opposite that which it originally occupied, wherein it lies over the body of the blank, and in this movement of the plate upon its two axes, it has carried the upper ply relatively backwardly to the reverse of that position which is occupied in the original blank. The plate E, therefore, is a direct and positive agency in folding the paper, or, in forming the diamond, and it is hence appropriately called a "forming-plate."

The hoe-like plate G of the Patterson Patent does not have these motions seen to belong to the plate E of the Liddell Patent, and consequently it could make no use of side fingers or grippers, and could not, as it does not, have any active agency whatever in carrying the upper ply from one position to another or in folding it over its own edge. It is, therefore, not a "forming-plate," and could not with any propriety be so called. It is merely a tucker plate or a cross-fold defining plate. Accordingly we find in the Patterson Patent other means entirely unconnected with the tucker plate G, for lifting the advanced end of the upper ply of the blank, and carrying it backward over the advancing plate G, such other means being the revolving fingers H H, shown in Figs. 1A, sheet 1, 2A, sheet 3, and 9, sheet 5, and described at page 2, line 76, *et seq.*

As I before said, the tucker plate G of the Patterson Patent is essentially an edgewise reciprocating plate, in which respect it corresponds with several other plates in the art for performing the same function. Such plates are usually called presser-plates because, being arranged in a horizontal position, after being lifted to allow the blank to advance beneath them, they descend and press upon the blank, while advancing with the blank and forming a thin, rigid body over the advanced edge of which the upper ply is turned back in forming the diamond. Patterson has seen fit to suspend this plate from an elevated pivot for the purpose of giving both its rising and falling and its forward and backward movement, but he has in no essential changed its real character and function, and much less has he made it an oscillatory "forming-plate." And I think defend-

ant's counsel fully recognizes this distinction, because I observe that, while in the question he speaks of the Liddell plate E as a "forming-plate," he does not speak of the plate G of the Patterson Patent as a "forming-plate." This, then, is another fundamental distinction between the two plates; one is a "forming-plate" and the other is not. Going back to the Lorenz & Honiss Patent, 337966, we have there a true forming-plate, but it is not a forming-plate combined or adapted to be combined with a continuously advancing or rotary bed, because it is not a forming-plate with two axes, or with its supporting axis remote from its creasing edge.

In the foregoing I think I have clearly differentiated the oscillatory, double-axised "forming-plate" E of the Liddell Patent, from the edgewise reciprocatory, non-axised, non-forming plate and mere tucker G, of the Patterson Patent, without differentiating said Liddell plate from that of defendant's machine, and I have also made it plain, I think, that the remoteness of the supporting axis of the Liddell plate E and of defendant's forming-plate from the edge axis of said plate, is not present in the hoe-like tucker plate of the Patterson Patent, even if the suspensory pivot from which the hoe is hung in said Patterson Patent, be called an axis of the plate, because said plate has no axis at its edge, and therefore, does not have two axes and, consequently, does not have its supporting axis remote from an axial edge.

I think I have heretofore sufficiently demonstrated that the doctrine of "remoteness," which is said in the question to be "absent from the Liddell Patent," is actually present in said patent, and "pervades" said patent as an underlying principle, as fully as the question declares it to pervade my testimony upon the subject of this patent.

x-Q. 446. My last question called for a definition, and your answer thereto contains more than a thousand words and does not contain any "definition" within the dictionary meaning of that term. Please allow me to try to frame such a definition as will conform to what I understand to be the view you entertain on this subject; and then state whether my definition does conform to your views.

6 The Liddell forming-plate is a plate which first presents its lower side to the upper surface of the forward part of the upper ply of a tucked paper tube, and which then flops over backward, carrying that ply of that tube with it through substantially 180 degrees of a circle, and meanwhile defines the primary transverse fold of the resulting diamond by means of its axis of work or defining edge, and also defines those two diagonal lines of the diamond which extend from its finger E′ to its fingers H H respectively, as shown in Fig. 8 of the Liddell Patent.

A. Counsel has a queer way of asserting in three or four lines of a question what he claims to have been the substance of a previous question containing three or four hundred words,
7 and usually, on comparison, it is found that he asked in the previous question something very different. In this case he makes a partial definition of the Liddell forming-plate, which, after my own explanation given in the last answer, distinguishes that forming-plate from the non-forming plate and mere tucker G of the Patterson patent. But he does not include in his definition of the Liddell forming-plate anything which makes it Liddell's, and not equally the forming-plate of the Lorenz & Honiss patent, 337,966, from which, in fact, it is just as broadly distinguished as from the tucker plate of the Patterson patent, though not in precisely the same particulars. Wherefore, the definition given by counsel in the question does not conform
8 to my views, and is far less comprehensive and complete than my statements of such views.

x-Q. 447. Am I right in understanding that the definition formulated by me in x-Q. 446 of the Liddell forming-plate, is equally applicable to the forming-plate of the Lorenz & Honiss patent 337,966; and am I right in understanding it to be your view that a true definition of the Liddell forming-plate must include some other characteristic than those specified in the definition suggested in x-Q 446, in order to differentiate the Liddell forming-plate from the Lorenz & Honiss forming-plate?

A. You are. The Liddell forming-plate is like that of said Lorenz & Honiss patent, when considered by itself, in respect

of its being a flopping plate, a lifter and a carrier for the upper ply of the bag blank, and a definer of the main transverse fold of the diamond. It is unlike the forming-plate of the Lorenz & Honiss patent, in having a new and different axis of support additional to its working axis or edge, adapting it for use in connection with a continuously advancing or rotary bed (which capability the Lorenz & Honiss forming-plate did not possess), and the plate thus changed becomes a part of a new operative conception and combination in the radically novel and different machine of the Liddell Patent in suit.

x-Q. 448. I agree with you that the Liddell forming-plate differs from the Lorenz & Honiss forming-plate in having an axis of support remote from its working axis or edge, and I also concede at once that that difference is a material difference. But I ask you to be equally frank and to admit that that particular improvement in forming-plates did not originate with William Liddell, but is fully described and shown in the Crowell patent 510,410 of December 12, 1893; in which patent I call your attention to the forming-plate 26 with its defining edge 23, as shown in Figs. 4 and 5 of that patent, and provided with the long hook 31 to perform the lifting function of the hook E′ of the Liddell Patent, and I also call your attention to the fact that that forming-plate has an axis of support midway between its defining edge 23 and the place of the shank of the hook 31 at the opposite edge of the forming-plate, and I also call your attention to the fact that that axis of support is movable up and down like the axis *c* of the Liddell Patent, so as to permit the forming-plate 26 to flop over backward like the forming-plate of the Liddell Patent, while its defining edge travels forward at an equal speed with the transverse line which it makes across the upper ply of the paper tube. I fully understand all the differences in construction and mode of operation and environment, which exists between the Crowell forming-plate and the Liddell forming-plate, and I have no objection to explaining those differences myself or to your explaining them at the proper time. But my present question is confined to this precise point, namely, does not the Crowell patent 510,410, contain a forming-plate which has a working axis or edge which

2 defines the primary transverse fold of a diamond, and moves forward at equal speed with the transverse line of that fold, and which forming-plate has an axis of support remote from its working axis or edge, and midway between that edge and the opposite edge of the forming-plate, to which latter a hook is attached, to perform the function of hook E′ of the Liddell Patent.

A. There may have been no intent to conceal from the court anything important in the asking of this question, but, taken in connection with preceding questions, it is proper, I think, to call attention at the outset to the fact that this Crowell patent is not one of the "nineteen" patents showing various means for making diamonds upon tucked paper tubes, like the two other 3 patents of the prior art which have been considered since the ostensible cross-examination on the "nineteen" patents was taken up. The Crowell patent is for a machine by which to open the simple diamond on an untucked tube, in the manufacture of what are generally called "satchel bottom" bags, in contradistinction to the bags known as "self-opening square" bags, to which latter art the Liddell invention particularly relates.

There are two queries in the question, or, perhaps, two forms of the same query. The first begins the second sentence of the question, and asks me to admit that "that particular improvement in forming-plates" (the provision of an axis of support remote from its working axis or edge), did not originate with 4 William Liddell, but is fully described and shown in the Crowell patent No. 510,410."

To this question I answer that I do not and cannot so admit, because such admission would not be in accordance with fact. First, the "forming-plate" of the Liddell Patent is a forming-plate for forming the diamond on a tucked paper tube, for which purpose it is provided necessarily with the side forming-fingers which enter the side tucks of the blank and not only lift, or take part in lifting, the advanced end of the top ply of the blank, but which also define the triangle folds peculiar to the diamond formed on a tucked paper tube, and constitute an essential part of such diamond. These side forming fingers

(H H in the Liddell Patent), may or may not be accompanied by a central end finger or clip (represented by E′ in the Liddell Patent), and said forming-plate E of the Liddell Patent, is, therefore, defined in each of the three claims here in suit as provided with the side tuck-entering fingers, and in one claim in suit as also provided with the end finger E′. Such is the "forming-plate" of the Liddell Patent in suit.

What counsel considers the forming-plate of the Crowell patent is a skeleton frame of rectangular form to the middle of each cross-bar of which is attached a central finger, one of which is marked 30 and the other one of which is marked 31, the finger at one side of the frame being directed one way and that at the other side the other way. The cross-bars carrying these fingers are connected and held parallel by connecting bars 25, 25, near their ends (See Fig. 1), and the patent shows a third cross-connection in the form of a "narrow plate 26," connecting the bars 23 and 24 at their middle, but which plate 26 the specification says, at page 2, line 77, may be dispensed with if desired. This dispensable plate 26 is all the "plate" that I find mentioned in the patent, and this is the plate which counsel in the question calls "the forming-plate 26." I do not, however, make any point on the fact that the revoluble frame is of skeleton form instead of being in the form of a continuous plate, a more material fact being that said frame is destitute of anything in the nature of side "forming fingers" which are necessary to constitute it the "forming-plate," or an equivalent of the "forming-plate," of the Liddell Patent in suit, and in the absence of which said frame is and would be incapable of any utility whatever in a diamond-forming mechanism for operation upon tucked paper tubes.

Secondly, the question defines this miscalled forming-plate of the Crowell Patent as having a single "defining edge 23" and a single long hook 31—not, indeed, using the word "single," but mentioning only one edge 23 and one hook 31, whereas, as a matter of fact, each of these has and must have an opposite

duplicate, as a vital requisite to the structure in the Crowell Patent. The specification says, at page 2, line 5:

> "This apparatus consists of a light rectangular frame composed of two bars 23-24, connected at their ends by cross-pieces 25 and at their centers by a narrow plate 26 [which is subsequently said to be non-essential] * * *. The bars 23-24 are also provided respectively with narrow plates or fingers 30-31, which extend from the bars so as to lie upon the opposite sides of and parallel with the plate 26, but a short distance therefrom."

A clear structural distinction here again exists between the revoluble frame of the Crowell Patent and the forming-plate of the Liddell Patent, and it will presently be seen that this structural difference is also an operative difference.

Third, the question calls my attention to the alleged fact that the miscalled forming-plate of the Crowell Patent has an axis of support midway between its defining edge 23 and the place of the shank of the hook 31 at the opposite edge of the forming-plate. This is not a fact at all. The connecting side bars 25 of the skeleton frame of the Crowell Patent, are indeed pivoted at their middle point to what are called in the patent "swinging arms 27, which depend from studs 28 fixed in side brackets 29 at the side of the machine." But said so-called "swinging arms 27" are really simply links, forming a sort of bridle or hold-back device, which has so little of a supporting function as to present no real analogy whatever with the supporting arms F F of the Liddell Patent in suit. The normal attitude of the revoluble, double-fingered frame is shown in Figs. 1, 3 and 4 but Fig. 1 should be taken into account in this connection, because it shows one of the end-bars 25 in its vertical thickness, as resting at its right hand end upon the stationary and horizontal bed 39, while the opposite end of said bar is upheld by the projection of one of the cross-bars which rests in the notch in the upper end of one of two similar propelling arms 32. There being one such connecting bar 25 at each end of the frame, both rest upon the bed at one end, and at the other end on the propelling arm 32 (this bed 39 is shown in Figs. 3, 4

and 5, as well as in Fig. 1, but has been omitted from the drawings in Fig. 2). In this normal or starting position of the double-fingered frame of the Crowell Patent, it is evident that the suspensory links 27 cut no figure as supports for said frame.

As to their function in other positions of the frame, it will be seen by reference to Figs. 4 and 5, taken together and with the description, that a bag blank, having its upper ply sprung upwardly by passing over the stationary bar 22, will pass with said upper ply over that one of the fingers 30 or 31, which happens to be lowermost at the time, and with its lower ply beneath that finger, and that at the proper time the vibratory arms 32 will be moved forwardly to the right, along with the bag blank, and that, in such forward movement, the arms 32 not only push the frame but support the contiguous side of the frame. The side links 27, acting like bridle reins, however, hold back the middle portion of the frame to the arc in which their pivots connecting them with the frame will be caused to move, and to this extent and in this sense, they take part in supporting the said frame. But when the propelling arms 32 have moved the lower edge of the frame forward far enough to bring said frame into a vertical position, or a little past the vertical, said arms retreat and leave the cross-bar 23 or 24 which then happens to be lowermost, resting on the paper, and of course supporting the weight of the frame. In the actual vertical position of the frame such support thereof from the paper is complete, and the links 27 perform no supporting function at all. As the frame passes the vertical it *leans* on the links and is held up by them to the varying angle which the frame takes in its descent upon its opposite side towards the body of the blank and the table 39. As it descends, the links control its movement, but all the while the frame rests at its lower edge upon the blank and table until it reaches practically a horizontal position, when, by its gravity and the chosen position of the fixed pivots 28 of the links, it swings backwardly into engagement again with the hooks 37 of the propelling arms 32, and there rests in a reversed position from that at which it started, ready for the next blank to pass beneath it.

From the foregoing it is evident that the skeleton frame (or plate, if it so please counsel) is centrally pivoted at its sides to *something*, and that, by such side pivoting, said plate or frame with its opposite and oppositely arranged fingers 30-31, is made a double-acting, finger-carrying frame, and that it cannot be operative at all upon successive blanks if it be not double-acting, or, in other words, provided with such *two* opposite and oppositely arranged fingers 30 and 31. It is also evident, as a law of the machine, that such side pivots of the frame must be always exactly in the middle of the double-acting frame to give uniformity of action, and further, that, after the propelling arms 32 have carried the plate or frame to a vertical position, it is thenceforward rotated or propelled solely by the paper on which it rests, and not at all by any mechanism acting on or through the side pivots or central axis. As to the defining action of the cross bars 23 and 24, successively, on the paper, it is true that they define the main transverse fold of the proposed bag bottom, and I do not make any special point of the fact that the patent provides that the paper shall be moistened along this line of fold to enable the edges of said cross-bars to so act upon the paper.

In view of the differences above pointed out between the reversible, double-acting, finger-carrying frame or plate of the Crowell Patent for folding back the rear flap of the diamond of an untucked tube, and the forming-plate E of the Liddell Patent, having as an essential part thereof the side-forming fingers for entering the side tucks of a tucked paper tube in the formation of a diamond upon such tucked tube, and having a literal and active second axis, which is an axis of support, remote from the working axis or edge of the plate, and through which axis of support said plate is advanced and retracted, and which axis of support may be varied in its distance from the single creasing edge of the plate, it is my opinion that the Crowell Patent cuts no figure as an anticipation of any material feature in said Liddell Patent and machine, although, as a literal fact, the revoluble frame of the Crowell Patent has a working axis or edge (it has one because it has two), which defines the primary transverse fold and literally moves forward at

equal speed with the transverse line of that fold, and has an axis of semi-support remote from each of its working edges and midway between them, and although the frame or plate has on each side a hook, as an essential part thereof, performing the function of the dispensable hook E' of the Liddell Patent.

[*Defendant's counsel objects to this answer on the following grounds:*]

[*First. The question was confined to a precise point, which was exactly and briefly stated as follows: "Does not the Crowell Patent 510,410 contain a forming-plate which has a working edge or axis which defines the primary transverse fold of a diamond, and moves forward at equal speed with the transverse line of that fold, and which forming-plate has an axis of support remote from its working edge or axis, and midway between that edge and the opposite edge of the forming-plate, to which latter a hook is attached to perform the function of hook E' of the Liddell Patent?"*]

[*Second. That question should have been answered by the word Yes or by the word No, without any additional word whatever; because it did not include any request for anything except an affirmance or a denial of the proposition of the question.*]

[*Third. The answer of the witness occupied him nearly half a working day in its composition and dictation to the typewriter operator, and contains more than two thousand words and does not contain any answer to the question.*]

[*Fourth. The answer consists of a long argument ending in a statement of a conclusion, and which statement is in the following words: "It is my opinion that the Crowell Patent cuts no figure as an anticipation of any material feature in said Liddell Patent and machine."*]

[*Fifth. That opinion of the witness was not called for by the question, and no opinion of the witness was called for by the question, upon the effect the Crowell Patent should have upon the Liddell Patent.*]

[*And now defendant's counsel states to the court that the letters patent prior to that of Liddell which are in evidence in the case, are 23 in number, and that they con-*

tain more than two hundred sheets of drawing, and a corresponding amount of specifications, making in all a pile of printed papers of ordinary thickness more than an inch high. Inasmuch as the witness has now occupied nearly half a day in his answer to a question which was confined to one part of one of those 23 patents, it would appear that if he were to be cross-examined on all of those patents and if his answers were to be equally long in respect of them all, the present cross-examination would last several years and might conceivably continue until after the expiration of the patent in suit on April 28, 1913, and still not contain any testimony whatever upon the points inquired of in the question.]

[*For these reasons the defendant's counsel submits to the court that the course of the witness amounts to a denial of the right to cross-examine; because that course consists in evading the questions put, in many cases, and in occupying hour after hour in the undertaking of inserting in the record in response to each of many cross-questions thousands of words not called for by those questions respectively. But in the absence of an official authorized by law to compel the witness to fairly answer the cross-questions put to him, and to omit to insert any other matter in the record, the defendant's counsel feels compelled to discontinue at this point asking questions of the witness relevant to the 23 prior patents or any of them.*]

x-Q. 449. What has become of the so-called Liddell model which Mr. Ward made about two years ago, and which you spoke of in your first deposition in this case, given in June, 1902, in your answers to x-Qs. 10 to 15 inclusive, and in your answers to x-Qs. 36 to 40 inclusive, and in your answers to many later questions; and which model you stated was in an adjoining room when you were giving that deposition; but which model the complainant's counsel positively refused to allow me to see at that time, and which model always since that time has been carefully kept secluded from my sight and from the sight of everybody connected with the defendant?

A. I do not know.

x-Q. 450. When did you last see that model?

A. At the time of giving the testimony in my first deposition referred to in x-Q. 449.

x-Q. 451. Did that model when you saw it, have any flattening plate analogous to the plate A or the plate B of the so-called Liddell machine at 451 Washington street?

A. It did not.

x-Q. 452. Everybody who had anything to do with that model, including Mr. Betts and Mr. Ward and yourself, was really ashamed of it, was he not, so that it was decided by those representing the complainant to keep the model entirely secluded, and away from my sight, and from the sight of everybody connected with the defendant.

A. I have never heard anyone say that he was ashamed of it, and never saw any indication that anyone was ashamed of it.

x-Q. 453. Why has that model (which you testified in June, 1902, was the only machine or model ever made in conformity to the Liddell Patent in suit as far as you knew at that time), been kept entirely secluded and away from my sight at all times, since it was made nearly two years ago, up to this moment?

A. I don't know.

[*Adjourned to Friday, December 18, 1903, at 10:30 A. M.*]

Friday, Dec. 18, 1903, 10:30 A. M.

[*Met pursuant to adjournment.*]

Present—The Notary, and Counsel as before.

x-Q. 454. The first cross-question put to you in this case was x-Q. 9, now printed on page 80 of the complainant's record. That question was put and answered more than a year and a half ago, and in your answer you stated, that you did not then know that any paper bag machine had ever then been made in conformity with the Liddell Patent in suit. Now please to

state whether you now have any knowledge that any paper bag machine was ever made in conformity to the Liddell Patent in suit; other than the so-called Liddell machine at 451 Washington St., relevant to which you have testified from time to time in the present deposition during the last six weeks, and which so-called Liddell machine is held by me to be not in conformity to the Liddell Patent in suit; though said by you to be in conformity with that patent.

A. I have no knowledge that any other machine has been built in accordance with the Liddell Patent than that referred to as being at 451 Washington St., leaving out of account the model made by Mr. Ward and brought into the testimony in this case on the cross-examination in my opening deposition.

x-Q. 454. Is that Ward model the same model that is referred to in x-Q. 449 to 453, inclusive, and the answers thereto, of your present deposition?

A. It is.

x-Q. 456. Can the so-called Liddell machine at 451 Washington St., make any paper bags without its flattening plate A or its flattening plate B and without any flattening plate in the place of either of those?

A. Yes.

x-Q. 457. How do you know that, and how can that result be accomplished without any flattening plate at that place?

A. I know that from seeing it done. It is accomplished after a fashion, because the paper, once laid in the form of a diamond, keeps that form to some degree in the absence of the flattening plate, though imperfectly and with the result that the finished bags are not so perfect as they should be, or so perfect as they are when the paper is held in the diamond form by the flattening plate, while proceeding to the mechanism for pasting and making the final folds of the box.

x-Q. 458. When did you see that machine run without any flattening plate?

A. I cannot name the days, but it was prior to the date of the first run of 2,000 bags testified about, I think, and once subsequently. The machine was not run by power, but I ran it by hand in these particular instances.

x-Q. 459. It appears in this record that I have over and over again asked the complainant's counsel to run that machine in my presence without any flattening plate, and that the complainant's counsel did not grant that request on either of the occasions when I inserted it in the record.

I therefore ask you whether I was present at any time when you ran that machine without a flattening plate?

A. You were not.

x-Q. 460. The first occasion when you ran it without a flattening plate was before you began giving the present deposition, was it not?

A. It was.

x-Q. 461. It is true, is it not, that you and I have been present with that machine on three different days since you began giving the present deposition, and that on the last two of those days Mr. Lorenz was also present and ran the machine with power with the flattening plate A and the flattening plate B thereon, respectively, and that on both those occasions I requested the complainant's counsel to simply remove the flattening plate which was on the machine at those times respectively and then run the machine without any other change therein?

A. I think you have made all that appear several times on the record. In fact, I think your requests themselves are part of the record.

x-Q. 462. Now I inquire, on a point of comparative dates, and I ask you whether the second and last occasions on which you ran that machine without any flattening plate was before the two occasions whereon I saw it run with a flattening plate, or was between those two occasions, or was later than them both?

A. Repeatedly referring to the matter as the "running" of the machine separate from my statement that I ran it by hand, may finally lead to a wrong impression, and I therefore wish to say right here that the running by hand referred to consisted merely of giving the machine a turn or two, at most, on one occasion and less than a full turn on another, carrying perhaps four or five blanks through the pasting and flap-folding

devices on one occasion and a blank or two only on the other occasion. Now answering the question, I should say, from recollection, that the second and last occasion referred to was before the two occasions when power runs were made in the presence of defendant's counsel, but I am not absolutely certain that it may not have followed the first of those two runs.

x-Q. 463. How many paper results were produced by that machine on both the occasions when you ran it by hand without any flattening plate?

A. I didn't count them, but should say about half a dozen.

x-Q. 464. What has become of them?

A. I did not preserve them.

x-Q. 465. Did any one of them constitute a paper bag which would hold granulated sugar, if filled therewith?

A. I can't say, I did not try them. They were not shapely enough for commercial purposes, and for that reason alone would not pass muster.

x-Q. 466. It appears in the deposition of Mr. E. G. Fisher in this case that he is the President of the Union Bag and Paper Co. and that that company has a capital stock of $27,000,000, and that it owns all the stock of the Eastern Paper Bag Co. (which is the complainant in this case), except a very small number of shares, and that it has owned a majority of the stock of the Eastern Paper Bag Co. since long before this suit was brought, and it appears in your testimony that the Union Bag & Paper Co. in September, 1903, was running about 150 Stilwell machines, making self-opening square paper bags in its factory in Sandy Hill, N. Y., and it appears in Mr. Fisher's deposition that Lorenz Exhibit No. 3 is a specimen of the bags being thus made by the Union Bag & Paper Co., and it appears in your present deposition that when you visited that Sandy Hill factory in September, 1903, a large number of Lorenz & Honiss machines for making similar self-opening square paper bags were idle and unused in that factory. Now please to state whether you learned that that idleness of those Lorenz and Honiss machines had continued already for a long time, on the one hand, or whether, on the other hand, you learned that they were simply idle on the day you saw them, but had

been running regularly up to that time and were expected to be regularly run again in the near future?

A. I learned nothing about that matter. I made no inquiries and I was given no information voluntarily on the subject.

x-Q. 467. Have you ever been consulted by Mr. Fisher or Mr. Betts or Mr. Chambers or Mr. Stilwell or Mr. Lorenz or Mr. Honiss or Mr. Claussen (all of whom are now in the employ of the Union Bag & Paper Co., as appears in the present record), upon any question relevant to any policy or program of that corporation in the matter of what machines are to be made or are to be run hereafter by the Union Bag & Paper Co. in the manufacture of self-opening square paper bags substantially like Lorenz Exhibit No. 3 or Lorenz Exhibit No. 2?

A. I have not.

x-Q. 468. Now I am informed and believe that the numerous Lorenz & Honiss machines which you saw idle at Sandy Hill, N. Y., in September, 1903, had then been idle a long time, because they were worn out from constant use during many years, varying in number from 12 to 17 years; and I infer, from all of my knowledge and information upon the subject, that the Union Bag & Paper Co. during the past two years has been requiring a large number of new machines to take the places of those Lorenz & Honiss machines, and has been building a considerable number of new machines for that purpose; and I ask you whether you do not understand that my information and belief, and also my inference, are in conformity with the facts upon those subjects?

A. I have no information on the subject referred to, which is entirely outside my sphere.

x-Q. 469. Have you any information or belief, based on information, that the Union Bag & Paper Co. has ever done anything toward building any machine in conformity to the Liddell Patent in suit, other than the so-called Liddell machine at 451 Washington St.?

A. I have given all the information I have relative to said Liddell machine, and I have no information concerning the purposes of the company with respect to the building of other

machines, either like that of the Liddell Patent or any other kind.

x-Q. 470. Your answer is not responsive to the question at all, but is confined to other points. Please to answer x-Q. 469 in the negative or in the affirmative, as the case may be?

A. I have no information, or belief, based on information, whether or not that company has done anything in the direction of the question.

x-Q. 471. Now I want to prove by you the details of the differences between the drawings of the Liddell Patent in suit and the drawings which you have presented and put in evidence of the Liddell machine at 451 Washington St., and I want to prove those details as matters of fact, entirely disconnected with any argument relevant to their materiality or immateriality, and I must ask you in this part of the cross-examination to abstain from volunteering your views upon questions of materiality of the differences which may be developed. I begin by calling your attention to "Complainant's Exhibit Liddell Paper Bag Machine Cylinder & Paster Roll" and I also call your attention to figure 1 of the drawings of the Liddell Patent, and I ask you to undertake to enumerate the differences between the cylinder C of the drawings of the Liddell Patent and the cylinder of the so-called Liddell machine which is shown in that complainant's exhibit?

A. As cylinders there is no difference between them. As each a series of rotary beds, the cylinder as shown in Fig. 1 of the Liddell Patent drawings carries or forms two beds, or is a two-bag cylinder. As described in the patent specifications the cylinder may have any desired number of beds. In the exhibit drawing of the actual machine, the cylinder is shown as forming four beds, or as a four-bag cylinder. In the drawings of the Liddell Patent the cylinder is shown as having two gaps in its periphery for the accommodation of the two opposite end clips *c* (see Figs. 2, 3 and 4), and in the exhibit drawing of the question there is also a gap in the periphery of the cylinder for the accommodation of each of the four end clips, and consequently there are four gaps, instead of only two, as shown in the patent drawings. In the patent drawings said gaps, as

indicated in Fig. 2, are limited to the transverse middle of the periphery of the cylinder, while in the exhibit drawing they are left extending clear across the cylinder.

x-Q. 472. Please to listen while I undertake to enumerate the differences called for by the last question, as follows: the cylinder C of the Liddell Patent has a plain continuous periphery, except that that periphery has two diametrically opposite rectangular holes of a small extent for the reception of the narrow front nippers c (which nippers may, however, according to the patent be omitted, and which omission will involve the omission of the holes for their reception). On the other hand, the cylinder of Complainant's Exhibit Liddell Paper Bag Machine Cylinder & Paster Roll is an irregular and complicated revolving structure, having many features totally absent from the cylinder C of the Liddell Patent. Those features include the following. Four deep gaps, or mutilations, extending a third of the way from the outer limits of the cylinder to its central shaft B. Four less deep gaps midway between the four great gaps and occupied by four oscillating shafts, respectively, each of which appears to carry an oscillating blade, which projects beyond the outermost limits of the cylinder and which four gaps, with their contents, are totally unknown to the Liddell Patent and entirely absent from the drawings thereof. Four shallow gaps, or notches, extending laterally across the periphery of the cylinder under the location of the side folding fingers G. Again, an elaborate system of arms, shafts and springs delineated on the exhibit between the side folding finger G and the shaft B and implied as being repeated three times at equal distances around the cylinder, so as to furnish the cylinder with four of those elaborate systems of shafts, arms and springs. Now that I have thus enumerated at least some of the differences between the two cylinders, I ask you to state whether my enumeration is not correct as far as it goes?

A. It is not. The arms, shafts and springs said in the question to be shown on the exhibit "between the side folding finger G and the shaft B" are not parts of the cylinder, but are devices, which, though mounted on the cylinder, or connected

therewith, would naturally form the subject of additional questions under the general proposal of x-Q. 471. The four so-called "less deep gaps" in the cylinder might have been mentioned by me, but they belong, with their contained vibratory pinching jaws, to the flap creasing and folding mechanisms which, in the machine of the exhibit drawing, are made to co-operate with the cylinder. The small notches in the periphery of the cylinder also pertain to the creasing mechanism of the flap folding devices. This is illustrated by the creasing and pasting segment seen at the upper right hand side of Fig. 1 of the exhibit drawing.

The statement in the current question is also in error in saying that the omission of the front nippers shown in the Liddell Patent drawings "will involve the omission of the holes for their reception" in the periphery of the cylinder. I do not think this is a necessary inference, although if the machine be made with the view of handling connected blanks, together with drag-rolls to draw the connected blanks along with the cylinder, instead of separated blanks and employing an end clip for each blank provided for by the cylinder, said holes will naturally be omitted. But the same thing is true of the Complainant's Exhibit drawing, which is made with gaps for the end clips. If the end clips be omitted from the machine represented by the drawing, the gaps would naturally also be omitted and the periphery of the cylinder left continuous. There is, therefore, no difference in kind between the cylinders with respect to said gaps.

The statement of the question that the cylinder of the exhibit drawing "is an irregular and complicated revolving structure, having many features totally absent from the cylinder C of the Liddell Patent," is, in its form, capable of being misunderstood, inasmuch as the "irregularity" consists solely in the gaps made in its periphery and its alleged "complications" consist only in the provision of parts necessary for the proper bearing support of the fingers and shafts, while the springs and the connections for the springs, with the fingers and clips, form no part of the cylinder at all.

x-Q. 473. Have you forgotten already that each of the deep gaps in the cylinder of the so-called Liddell machine at No.

151 Washington street is occupied by mechanisms other than the nipper *c*, and other than any mechanisms shown in Complainant's Exhibit Liddell Paper Bag Machine Cylinder & Paster Roll, and other than any mechanism shown in the Liddell Patent?

A. I recall that the machine has certain additional clips which act at opposite sides of clip C to allow retraction of the latter out of the way of the Paster Roll, which additional clips also work in the gaps referred to. But the omission of the central clip *c* of the machine would involve the omission of such additional end clips.

x-Q. 474. Please now to look at "Complainant's Exhibit Drawing Liddell Forming-Plate Operating Parts" and please to compare the cam K′ of that exhibit with the cam K′ of the drawings of the Liddell Patent in suit and state whether those two cams are not totally unlike in outline.

A. They are unlike in outline.

x-Q. 475. Are they not totally unlike in outline, and so much so that in the absence of a designating letter or mark nobody would ever conjecture that they had any relation to each other?

A. Similarity or difference in outline between a cam illustratively shown in connection with parts by which it is moved and with parts which it moves, in a patent drawing, and the same cam in the same relations in the working drawings of a machine, is not what any person acquainted with mechanics would consider at all in identifying or distinguishing such cams. The identity of cams would, under these circumstances, be judged by their relations. In this case the two cams are mounted on the same shaft and are represented as actuating the same part or parts, and there could be no mistake as to their being the same cam, without any reference letter at all.

x-Q. 476. Have you any desire to fairly answer my question, or are you absolutely determined to evade such of them as you please to evade, and on this point I call your attention to the fact that I began this part of the cross-examination in x-Q. 471 by telling you that I wanted to prove the details of the differences between the drawings of the Liddell Patent in suit and

the drawings which you have presented and put in evidence of the Liddell machine of 451 Washington street, and that I wanted to prove those details as matters of fact, entirely disconnected with any argument relevant to their materiality or immateriality, and that I must ask you to abstain from volunteering your views upon questions of the materiality of the differences which may be developed, and I also call your attention to the fact that x-Q. 475 was confined to the difference between two cams and did not include any question about the environment of those cams or of their use nor any question which gave you the lightest excuse for volunteering an argument on the subject of cams in general, and I also call your attention to the fact that your answer does not contain any reply whatever to the question which was put to you, and which question, as I have said, was confined to a comparison of those two cams, in respect of their outlines. I therefore ask you again whether you have any desire to fairly answer my question, on the one hand, or whether, on the other hand, you are absolutely determined to evade such of my questions as you please to evade?

A. I desire to fairly and fully and truthfully answer every question asked me. As to x-Q. 475, it speaks for itself, and clearly was not confined exclusively to the outline of the cams but included the question as to what would be conjectured by somebody looking at the cams. And my answer seems to me to have been appropriate.

x-Q. 477. Please to state whether the two cams inquired of are not totally unlike in outline?

A. What is meant by "totally" in this question?

[*Defendant's counsel calls the attention of the court to the drawing specified in x-Q. 475 and to the drawings of the Liddell Patent in suit, and particularly to the cams* K′ *shown in those two drawings respectively, and defendant's counsel submits to the court that the word totally is a well-known word in the English language and that the request of the witness to be told the meaning of that word is a mere quibble, in keeping with his general conduct as a witness in this case, and defendant's counsel withdraws x-Q. 477 because he wishes to express in that way*

his sense of outrage at the evasions and quibbling of the witness.]

[*Complainant's counsel objects to the language used under the guise of objection as above by defendant's counsel and requests defendant's counsel to confine himself to proper and legal objections, fit for the record, which is not a suitable place for the expression of defendant's counsel's feelings, whatever they may be.*]

x-Q. 478. Please now to compare the cam K of the Liddell Patent in suit with the cam K of the Complainant's Exhibit Drawing Liddell Forming-Plate Operating Parts, and state whether those two cams are not totally unlike in outline?

A. The outline of the cam K in the Exhibit Drawing is very unlike that of the cam K as shown in Fig. 1 of the Liddell Patent drawing. Possibly the two are "totally" unlike; but, on the other hand, it is possible that the enlargement of the contour of cam K given in Fig. 1 of the Liddell Patent drawing to the same scale on which the corresponding cam K of the Exhibit Drawing is shown, would give coincidence of some part or parts of their outline, in which case they might be said to be *not* "totally" unlike. Wherefore, all that I can say in intelligently answering the question is, that the Liddell Patent Drawing shows the cam K with a very different contour or outline from that which it takes in the working machine and which is shown in Complainant's Exhibit Drawing Liddell Forming-Plate Operating Parts.

x-Q. 479. It is true, is it not, that in the drawings of the Liddell Patent the gears M′ and N are identical in diameter, whereas in the so-called Liddell machine at 451 Washington street and in the Complainant's Exhibit representing that machine the gear N is only one-half the diameter of the gear M′?

A. It is not true that in the Liddell Drawing the gear wheel N is of identically the same diameter as the gear wheel M′. It has that general appearance, but under careful measurement the gear N is found to be slightly smaller in diameter than the gear M′. In the machine at 451 Washington street the gear wheel N is one-half the diameter of the gear M′ and it is approximately so shown in said Exhibit Drawing.

x-Q. 480. I am carefully measuring with a finely graduated ruler the gear M′ and the gear N, in the drawing of the Liddell Patent, and I cannot detect the slightest difference between their respective diameters, finding the circles which indicate those diameters to be identical, as I measure them; but you are the witness who is giving this deposition, and therefore I ask you to state exactly what is the difference which you think you detect in those two diameters?

A. We have no such precise instruments as enable me to state the exact minute difference which I find between the two gears, and I make no point whatever of any such difference, It is true that the Liddell Drawing shows the gear N and the gear M′ practically of the same diameter, with an inappreciable difference which is of no account whatever.

x-Q. 481. It is true, is it not, that in the Liddell Patent an arm projects upward from the gear M′ a distance equal to one fifth of the diameter of that gear, and that the link k^2 is pivoted to the upper end of that arm, whereas in the Liddell machine at 451 Washington street and in the drawings representing that machine that link is pivoted to the gear itself midway between its periphery and its axis, though three times as far from its axis as from its periphery?

A. That is substantially correct, the difference being a variation in the length of the leverage with which the link acts on the gear M′.

x-Q. 482. It is true, is it not, that that change of leverage reduces by one-half the necessary lengthwise motion of the rod *k*, and which motion has its function in rocking the gear M′ through the link k^2, so that to produce a given oscillation in the gear M′ the rod *k* of the so-called Liddell machine needs to reciprocate only one-half as far as it would have to do if the drawing of the Liddell Patent had been followed in pivoting the link k^2 to an arm extending upward from the gear M′?

A. Everything else being equal, the shortening of the leverage on the gear M′ proportionately reduces the necessary lengthwise motion of the rod *k*, and in this case the leverage is shortened about one-half.

x-Q. 483. It is true, is it not, that that shortening of that

leverage and the resulting shortening of the lengthwise reciprocation of the rod *k* enabled Mr. Lorenz, who built the so-called Liddell machine to reduce by one-half the difference between the length of the shorter horn and the length of the longer horn of the cam K, and thus reduce the steepness of the working inclinations of that cam?

A. I have no doubt Mr. Lorenz took these matters into account in designing the actual machine, as any judicious mechanic would do.

x-Q. 484. If Mr. Lorenz had followed the drawings of the Liddell Patent exactly in respect of the pivoting of the link k^2 to the arm extending upward from the gear M', that course would have compelled him to make the difference between the shorter horn and the longer horn of the cam K about three inches, instead of being about an inch and a half, as it is in Complainant's Exhibit "Drawing Liddell Forming-plate Operating Parts," would it not, in order to enable that cam to impart to the rod *k* twice as much longitudinal motion as it has in the so-called Liddell machine?

A. Not to adopt the precise figures of the question, the use of the longer leverage shown in the Liddell Patent drawing for attachment of the link k^2, would have required a longer throw of the cam in the direction and to perhaps about the amount or proportion indicated in the question.

x-Q. 485. The cam K is a very steep cam in the so-called Liddell machine, is it not, and to increase its steepness so much as would be involved in doubling the difference between the lengths of its horns would make that cam too steep to be operative at commercial speed, would it not? Before you answer this question, I will submit to you an analysis, which I have made of the factors of that problem, and which may be fuller than an analysis which you would make extemporaneously in reply to this question. My analysis is as follows:

Looking at Complainant's Exhibit Drawing Liddell Forming-plate Operating Parts, it is apparent that the shaft L carries the cam K and turns that cam in an anti-clockwise direction. During the first quarter of a revolution from the position shown in Fig. 1 of that drawing the roller at the lower end of

the rod *k* moves along the periphery of the cam K at about one distance from the centre of the shaft L. But during the second quarter of a revolution that roller rides upward along the edge of the cam K from a position only 2 1/8 inches away from the centre of the shaft L to a position 3 3/4 inches away from the same centre. This rising of the roller more than an inch and a half from the centre of the shaft L in one-quarter of a turn results in moving the rod *k* lengthwise the same distance. But that movement is caused by a force operating diagonally to the length of the rod, and is confined to a movement in the direction of the length of the rod by means of the slide or slides in which the rod *k* reciprocates. That confinement results in a tendency of the rod to cramp in its slide. That cramping tendency is partly neutralized by profuse lubrication, and in the absence of that lubrication the rod would cramp and stop. Now if Mr. Lorenz had doubled the difference between the short horn and the long horn of the cam K, he would have largely increased the steepness of that edge of the cam along which the roller would rise during the second quarter of its first revolution from the position shown in Fig. 1 of the exhibit to and slightly beyond the position shown in Fig. 2 of that exhibit. That great increase of the steepness of the cam would have so much increased the tendency of the rod *k* to cramp in its slides that that rod could not have been compelled to reciprocate in both directions fast enough to run the machine at a commercial speed, because its largely increased tendency to cramp would have been apt to lock it in a position somewhere midway between that shown in Fig. 1 and that shown in Fig. 2 whenever its lubrication might run low; and even if that rod were never actually locked in position, the friction developed between its sides and the sides of its slides would be intolerable for a fast running machine.

[*Adjourned to Saturday, December 19, 1903, at 10:30 A. M.*]

Saturday, Dec. 19, 1903, 10:30 A. M.

[*Met pursuant to adjournment.*]

Present—The Notary, and Counsel as before.

[*Complainant's counsel states that he has been called up on the telephone by the witness, Mr. Dayton, from the uptown hotel where the witness is staying, and Mr. Dayton states that he is not well to-day, and is physically unable to proceed with his testimony, and Mr. Dayton further states that having been on the witness stand on every working day, except one Saturday, since November 5, as the record shows, he feels the physical need of a reasonable adjournment, during which he may be able to return to his home and office in Washington, coming back at the end of such reasonable adjournment to continue his deposition, and for cross-examination, and proceeding from day to day thereafter until his deposition is closed.*

In view of the situation, complainant's counsel asks defendant's counsel to consent to an adjournment of his deposition until 10:30 A. M. on Monday, January 4, at this office,—calling attention also to the fact that the intervening time includes the Christmas and New Year's holidays on Friday, December 25, and Friday, January 1, which days, and very probably the Saturday after each, would not be working days under any circumstances. But if defendant's counsel does not find himself in a position to formally consent to the adjournment asked upon the record, but feels himself compelled to object thereto, complainant's counsel requests the Notary here present, and who has authority over the making of the record and the granting of proper adjournments, that, under the circumstances stated and known to him upon the record, he shall, in the exercise of his authority, adjourn the continuing of Mr. Dayton's deposition over as above requested.]

[*Defendant's counsel, while recognizing the apparent necessity of adjournment until Monday morning, objects to any further adjournment of the taking of testimony in this case.*]

[*The Notary states that, under all the circumstances, he*

thinks the application for adjournment reasonable and proper.]

[*An adjournment is taken until Monday, January 4, 1904, at 10:30 A. M.*]

Monday, Jan. 4, 1904, 10:30 A. M.

[*Met pursuant to adjournment.*]

Present—The Notary, and Counsel as before.

[*A telegram having been received from the witness, Mr. Dayton, stating that it would be impossible for him to attend before Wednesday morning, an adjournment was taken until Wednesday, January 6, 1904, at 10:30 A. M.*]

Wednesday, Jan. 6, 1904, 10:30 A. M.

[*Met pursuant to adjournment.*]

Present—The Notary, and counsel as before.

The witness, MR. MELVILLE E. DAYTON, proceeds to answer x-Q. 485.

A. The cam K in the machine referred to in the question has a rather steep rise, but not a rise so steep as to be objectionable, or so steep as to prevent the machine from being operated at a high speed. Nor, in my judgment, would some increase of that rise of the cam be objectionable. The question apparently assumes that doubling the throw of the cam necessarily doubles its steepness, which is not the case; or, if this be not the assumption of the question, it does not state in the alleged long "analysis," what its steepness will be. I think the question as to whether the cam made steeper to the extent contemplated in the question would be operative or not, is answered by Complainant's Exhibit Model from Fig. 1 Liddell Patent, where the link k^2 is pivoted to an arm attached to the rack gear M', instead of being pivoted to said rack gear within its circumference. In this model the cam K (at the back of the model), probably approaches the limit in steepness within

which it would be approved as suitable for rapid operation, but it is, I think, still within that limit.

x-Q. 486. Where a slide is to be moved lengthwise through a straight channel, by means of a cam, what rule, if any, is known to you, in respect of the maximum inclination of the cam to the base, or lower end of the slide, and which maximum inclination is the largest that is compatible with rapid commercial operation of such a slide by such a cam; and on this point I will call your attention to the obvious fact, that if the inclination of the cam were 45° to the base of the slide, it would also be 45° in the other direction from the lengthwise axis of the slide, and thus the power of the cam would be equally divided between its tendency to push the slide along its path, and its tendency to push the slide against the inner sides of the guide which would constitute that path?

A. As a rule, the angle of 45° will not be exceeded, if conveniently avoidable, but it may be exceeded allowably, where an anti-friction roller or rollers are used. In other words, it is my understanding that machine designers aim to keep within the 45° angle, when practicable, but go outside that angle when necessary.

x-Q. 487. Did you ever know that any automatic machine contained a slide worked by a cam with a steeper inclination than 30°?

A. I have no present recollection of the particular angle of a cam and slide in any machine which I ever saw, containing those elements, and am therefore unable to say.

x-Q. 488. Have you any knowledge on this subject, or are you simply guessing at the matter as you go along from answer to answer?

A. I am not guessing, but, on the other hand, am applying to the question the well known principle of the wedge, which controls in this matter, and which, I believe, forms the basis of the general rule which I understand controls engineers who have occasion to lay out, or to construct, cams in practical machinery.

x-Q. 489. Please to formulate that principle of the wedge to which you refer.

A. Assume a wedge having a 45° angle, with one of its sides movable on a horizontal surface, and the other beneath a movable body, sliding or movable in a direction perpendicular to the horizontal. The advance movement of the wedge beneath the slide gives to the slide a movement equal in extent to that given to the wedge horizontally. There is in this case an equal lateral and vertical pressure on the point of the slide resting on the wedge. If the wedge be of less than a 45° angle, its advance movement will be correspondingly greater than the vertical movement of the slide, and the lateral pressure of the slide will be correspondingly less than the pressure of the wedge on the slide. On the other hand, if the wedge have a greater angle than 45°, the conditions will be reversed. The wedge obviously acts with the more power, the less the speed it gives to the part which it moves, in this case the slide or vertically movable body, and the less the power to be applied to the wedge to give a desired vertical movement to the body or slide in a given time. Wherefore, a low pitched wedge (or, in a cam, a low pitched wedging cam surface), will be naturally selected, where the conditions so allow. Friction is an element to be taken into account, and accordingly, in connection with cams and slides, or other devices, such as arms, to be actuated by the cam, anti-friction devices are, or may be, employed, and where the lateral thrust on a slide to be actuated by a cam is relatively great, the guide for the slide is often provided with anti-friction rollers. More often, of course, oil or similar lubricants only are employed to lessen this friction, being also necessary where the lateral pressure is not great in order to keep the parts from heating or wearing, and sometimes both anti-friction rollers and lubricating fluids are employed, both in connection with simple wedges and with the wedge principle as employed in cams.

x-Q. 490. Please now to look at cam K on the back of "Complainant's Exhibit Model from Fig. 1 Liddell Patent," while I turn the crank of that model in the proper direction, and show you the roller at the lower end of the slide *k* riding upward along the edge of the cam from its lower position to its upper position; and state whether that cam is not too steep to work

such a slide in a rapidly running automatic machine like that at 451 Washington St.

A. I cannot say that it is too steep, but I judge that it is steeper than is desirable, in view of considerations of power and lubrication, and I suppose this fact led to the lessening of the steepness of the cam in the actual construction referred to, by the shortening of the radius to which the link k^2 is pivoted —in other words, to the pivoting of said link within instead of outside the circumference of the rack wheel M′, which the cam is called upon to oscillate through the medium of said link.

x-Q. 491. If the arm which extends upward from the gear M′ in this model had been made longer than it is, it would have been necessary, would it not, to make the cam K on the back of the model steeper than it is?

A. Certainly.

x-Q. 492. It is true, is it not, that that arm is shorter in proportion to the diameter of the gear M′ than it is in Fig. 1 of the drawings of the Liddell Patent?

A. There is *apparently* a difference in that direction, but it is more apparent than real. The parts and distances in the model are intended to be four and a half times those in Fig. 1 of the Liddell Patent. The distance from the center of the rack wheel M′ to the centre of the pivot joining the link k^2 with the arm of the wheel, is 29/64 of an inch, and four and a half times this distance gives 2 inches and 7/64, whereas in the model the distance, as given me by Mr. Walker, is exactly 2 inches. (I thought I made it a trifle less.) The difference between the two is, therefore, practically inappreciable. Mr. Walker also gives me the diameter of the rack-wheel M′ as 12-64 of an inch. This multiplied by 4 1/2 gives 2 61/64 inches, whereas in the model this rack wheel, measured from pitch line to pitch line as accurately as practicable with the implements we have, is 2 58/64 inches in diameter or has a radius of 1 29/64 inches. Working the difference out by proportion, I find that on the basis of a 4 1/2 times enlargement from Fig. 1 of the patent drawing, the distance of the centre of the pivot connecting the link k^2 with the arm, from the centre of the wheel M′ should be in the model, 1 61/64 of an inch, whereas it

80 is in fact 1 57/64 of an inch, or 1/32 of an inch only shorter than it should be. I regard this difference as of no practical consequence whatever.

The question literally calls for a comparison of relative projection of the arm beyond the periphery of the wheel M′, but the real question is finally one of ratio between the radius of the wheel to the pitch line thereof and the distance from the centre of the wheel to the centre of the pivot uniting the link k^2 with the arm, which I have above given.

x-Q. 493. It is true, is it not, that in Fig. 1 of the drawings of the Liddell Patent the arm which extends outward from the gear M′ does extend outward from the pitch line of that gear one-half the distance from the pitch line of that gear to the
81 axis of that gear; whereas, in "Complainant's Exhibit Model from Fig. 1 Liddell Patent," the corresponding arm extends outward from the pitch line of the corresponding gear only one-third the distance from that pitch line to the axis of that gear?

A. That is not true.

x-Q. 494. Now please to observe me while I make some measurements, and state whether they are correct, as set forth as follows: I find by drawing an arc of a circle concentric with the shaft L in "Drawing Liddell Paper Bag Machine Forming-plate Operating Parts," across the edge of the cam K in Fig. 2 of that drawing, about a quarter of an inch below the lower and of the slide *k*, that the rise of that edge of the cam at that place is 30° from that arc of a circle; and I find when making
82 the corresponding measurement of the cam K on the back of Complainant's Exhibit Model Fig. 1 Liddell Patent that the corresponding rise of that cam from a corresponding arc of a circle is 50°; and I thus find that the difference between the two cams includes the fact that the steepest pitch of the cam of the model is 50° while the steepest pitch of the cam of the drawing is 30°, the two measurements being made at the steepest places on the two cams.

A. I think that is about correct.

x-Q. 495. Now please to observe me while I make the following measurements. I find that the steepest pitch, or inclination, on the edge of the cam K′ of the drawing is 20°, and that

the steepest pitch in the corresponding cam of the model is 60°. Please to state whether these measurements are substantially correct, as measurements of the edges of the two cams?

A. They are, but I think the question should indicate the points on the drawing and model which are compared in the question, so that the court shall see, as I see, that in this cam K′, which co-operates with the pivoted arm F′, the rise of the cam might be very much greater than it is in either the drawing or the model without any objection whatever.

[*Defendant's counsel objects to all of this answer except the first two words, as being irresponsive and volunteered expression of opinion upon a collateral point not inquired of and in respect of which the witness is believed to be entirely in error.*]

x-Q. 496. Now please to state what other difference exists between the drawing and the model, which enables the two cams K′ to have the same effect in co-operating with other mechanisms to cause the edge W of the plate E to move forward coincident with a given line across the periphery of the cylinder C, notwithstanding the fact that the cam K′ on the drawing is very different in contour and very much less steep in inclination than the corresponding cam on the model.

A. Primarily, the difference in size between the two cams. The larger the cam, the less the *degree* of rise will be within radii separated by the same angle to give the same extent of throw. It is like the case of the dotted or perforated diagram of the shape of a man's head made by the machine hats employed by hatters to give a hat to fit. The dotted diagram doesn't represent the proportions of a man's head at all. If a series of lines be drawn around such a dotted diagram at uniform distance each from the other, and from the dotted line, the figure changes in proportions, until the actual shape of the man's head is reached when its size is reached. Or, take a parallelogram of twice the length of its width, or say four inches long and two inches wide. If you cut off a half an inch from each side, or even from two connecting sides, the proportions of what is left are continually changed, as any one may readily

see by taking such a piece of paper and either cutting off or folding over the sides equally.

x-Q. 497. I recognize the fact that if the contour of the cam K′ on the drawing were the same as the contour in the corresponding cam of the model, except in being larger, the necessary steepness of the edges of the cam in the drawing would be correspondingly reduced; but I observe, as you must do, that the two cams are widely different in general character of outline, as well as being widely different in size, and I ask you to state what other features of the two contrivances, or forms of contrivance, operate to neutralize the difference, so that the edge W of the plate E moves the same in both cases along the periphery of the cylinder C.

A. Pointing out that only a part of the contour of the cam in either case is concerned in governing the forward movement of the forming-plate in proper relation to the cylinder, and that the remainder of the cam periphery in each case is concerned in the return of the forming-plate to its starting position, or in retaining the plate at rest at the extremities of its throw, I explain that the difference in size between these two cams will explain the difference in contour in those portions thereof which are concerned in advancing the forming-plate with the cylinder after the edge of the forming-plate has descended to the cylinder. The descent of the edge of the forming-plate to the cylinder in the actual machine represented by the drawing is accompanied by a material advance of said edge, which is not the case in the model, and the cams will therefore differ in this particular. Then, in the machine the forming-plate is given a period of rest at each extremity of its throw, while in the model there is no perceptible period of rest given to the forming-plate at the outer extremity of its throw, and but a short period of rest in its starting position. The cams will therefore differ in contour in those portions concerned in these varying results. Still further, in the actual machine the edge of the forming-plate is given a particular path of return to its starting position different from that in the model, and the cams will differ in contour with respect to this matter also. I think it will be found that all the difference between the cams

K′ of the drawing and model are fully explained in the foregoing.

x-Q. 498. It is true, is it not, that Fig. 1 of Drawing Liddell Paper Bag Machine Forming-plate Operating Parts and Fig. 1 of the Liddell Patent both show the cam K′ in the same position relative to the arm F′, which is the position those two cams occupy when the edge W of the plate E is beginning to advance with the cylinder C by reason of the beginning of the elevation of the arm F?

A. Generally the same position, to wit, the starting position of the plate.

x-Q. 499. It is true, is it not, that in that drawing of the so-called Liddell machine the edge of the cam which then begins to operate during the forward movement of the plate E is inclined only 20° to a circle concentric with the shaft L; whereas, the edge of the cam K′, which then begins to operate, in Fig. 1 of the Liddell Patent, is inclined 70° from a circle concentric with the centre of the shaft L, so that the arm F′ in the Liddell Patent rides up an inclination of 70°, whereas the corresponding arm in the drawing of the so-called Liddell machine rides up an inclination of only 20°, when the two inclinations are respectively doing the same work in causing the forward movement of the edge W of the plate E?

A. I presume that is correct as to the relative degrees shown, and I would say that in either case the rise might be 90°, quite operatively, if that angle were required.

x-Q. 500. A 90° angle would be a right angle, would it not?

A. It would.

x-Q. 501. Now it is true, is it not, that there are numerous other differences between the mechanism shown in Fig. 1 of "Drawing Liddell Paper Bag Machine Forming-plate Operating Parts," and the mechanism of Fig. 1 of Liddell Patent Drawing, and that those other differences include the following: The gear M′ and the gear N are of the same diameter in the drawing of the Liddell Patent, whereas in the drawing of the Liddell machine the gear N is half the diameter of the gear M′. The proportions of the arms F and F′ to each other are not the same in the two drawings. The arms F and F′ extend away

92 from each other at an angle of about 65° in the drawing of the Liddell Patent, whereas in the drawing of the so-called Liddell machine those arms extend away from each other at an angle of less than 20°, measuring the angle of the arm F by a line drawn straight between its two ends in both cases, or rather between the axes of the shafts at its two ends, and measuring the arm F′ midway of its width. I mention these differences as additional to the differences between the cams K of the two drawings and the differences between the cams K′ in the two drawings and the difference of leverage by which the rod *k* and the link k^2 operate to rock the gear M′, most of which differences have already been canvassed in this deposition.

A. The differences referred to in the question all exist substantially as stated.

93 x-Q. 502. Now please to look at King Exhibit No. 1, which shows how Mr. King worked out the path of the edge W of the plate E, which would result from a mechanism constructed exactly like the mechanism of drawing No. 1 of the Liddell Patent, and state whether you know any reason to deny or to doubt the correctness of Mr. King's work on that drawing, King Exhibit No. 1, or the truth of the theoretical path delineated thereon as being the path of the edge W of the plate E.

A. I know of no reason for such doubt or denial.

x-Q. 503. It is true, is it not, that if a machine were built exactly like Fig. No. 1 of the Liddell Patent there would be an interference between the plate E and the cylinder C in that mechanism, which interference would consist in the edge W of
94 the plate E striking the periphery of the cylinder C very soon after starting and in the fact that the theoretical path of the edge W as shown in King's Exhibit No. 1 passes far below the periphery of the cylinder C during its forward movement and also passes some distance below that periphery through a crooked path during nearly all of its return motion, as shown in King's Exhibit No. 1.

A. I should expect some such interference or equally objectionable action from a machine built exactly in accordance with Fig. 1 of the Liddell Patent drawing, and particularly as to the shape of the cams K and K′, and, without critical an-

alysis of Mr. King's drawing No. 1, I am willing to assume that he correctly delineates the path which would be given to the edge W of the forming-plate in such a machine.

x-Q. 504. It is true, is it not, that in the so-called Liddell machine and in the mechanism shown in "Drawing Liddell Paper Bag Machine Forming-plate Operating Parts" Mr. Lorenz obviated that interference and all other aberrations incident to mechanism exactly like Fig. 1 of the Liddell Patent?

A. That is true, Mr. Lorenz having sense enough to know that the Liddell Patent drawings were not working drawings, and also good mechanical judgment generally, in the construction of a machine under the Liddell Patent. And in this connection I call attention to Complainant's Exhibit Model Fig. 1 Liddell Patent as showing equally an avoidance of all interference between the forming-plate and cylinder, and absence of all aberrations, notwithstanding that, in said model, no changes at all have been made except in the contours of the cams K and K'. The gear M' and the gear N are of the same diameter as in the drawing of the Liddell Patent; the proportions of the arms F and F' to each other are the same as in the patent; the arms F and F' extend away from each other at the same angle as in the drawing of the Liddell patent, and the rack gear M' is provided with the arm for lengthening the leverage through which the slide oscillates said rack wheel as in the patent. Only the cams K and K' are different from the patent drawing in their contours, not being changed in position or in any other respect than that of outline.

[*Defendant's counsel objects to all of this answer except the first three words, as being totally improper and a volunteered argument by the witness on collateral matters.*]

[*Hereupon defendant's counsel calls the attention of the court to this example of the great difficulty that is involved in cross-examining this witness, which difficulty consists in it being nearly impossible to induce him to confine his answers to the questions put, and it being totally impossible to induce him to abstain from lumbering up the record with long partisan arguments whenever he thinks he sees a chance to help the complainant by taking that course.*]

[*Defendant's counsel reminds the court that Judge Coxe and Judge Townsend and other Judges have severely criticised some counsel for too lengthy cross-examinations; and defendant's counsel suggests to the court that the parties really responsible for those too lengthy cross-examinations are generally the expert witnesses, who persist in inserting in the record great masses of collateral and erroneous matter which is not called for by questions put to them.*]

x-Q. 505. It is true, is it not, that before Mr. Lorenz thus obviated that interference and all other aberrations incident to mechanisms like Fig. 1 of the Liddell Patent, Mr. Ward, another mechanical expert of the complainant, had tried to do so, with the result of producing a model in 1902, which the complainant's counsel was ashamed to show defendant's counsel and which has been carefully secluded from view of anybody connected with the defendant up to this time in 1904?

A. Is this a question, or an argument, or a mere soliloquy? If a question, an answer can be expected from me only to the inquiry as to whether or not Mr. Ward tried to "obviate that interference and all other aberrations incident to mechanisms like Fig. 1 of the Liddell Patent," and to this perhaps legitimate question I reply that Mr. Ward did try and did succeed, in a model produced by him in 1902. As to whether complainant's counsel was "ashamed" to show that model to defendant's counsel I am entirely uninformed, and I am also uninformed as to whether or not said model has been carefully or otherwise secluded from the view of anybody connected with the defendant up to this time in 1904.

x-Q. 506. It is true, is it not, that some months before Mr. Lorenz made the so-called Liddell machine or planned the "Drawing Liddell Paper Bag Machine Forming-plate Operating Parts" the defendant's expert King obviated the interference and the other aberrations incident to mechanism like Fig. 1 of the Liddell Patent and fully explained, in his deposition in this case, how he obviated that interference and those aberrations and also showed his plan for accomplishing that result by making and presenting defendant's drawing No. 13? And it is also true, is it not, that when Mr. Lorenz came to tackle the

same problem he followed King in reducing the diameter of the gear N just one-half, and also in reducing the leverage through which the rod *k* rocks the gear M′, and also in changing the proportions of the arms F and F′, and also in reducing the angle at which those arms extend away from each other, and also in largely changing the outlines of the cams K and K′; while omitting to follow Mr. King in respect of the exact contours of those cams?

A. It is true, as the testimony shows, that Mr. King found out how to avoid interference and aberration of the parts, as illustrated in Defendant's Drawing No. 13. It is also true that in that drawing the gear wheel N is made one-half the diameter of the rack wheel M′ and that the arm F′ is made shorter in proportion than the arms F. It is also true that he shortened the leverage through which the link k′ acts on the gear M′. Principally it is true that he changed the contour of each of the cams K and K′. It is further true that Mr. Lorenz built the actual machine referred to, as I am informed, subsequently to the production by Mr. King of this drawing, and that therefore Mr. Lorenz "followed" Mr. King in the matter of *date*. But I am not informed as to whether or not Mr. Lorenz had any knowledge of Mr. King's testimony or of defendant's drawing No. 13, and I still see no reason for concluding that Mr. Lorenz copied after Mr. King or that he did anything else than to exercise good mechanical judgment in the construction of said actual machine. If the question means to imply that the reduction in the relative size of the gear wheel N, or the shortening of the arm F′ relatively, or the shortening of the leverage on the rack gear M′ through which the link k′ acts, are each or all necessary to an operative result, this is contradicted by Complainant's Exhibit Model from Fig. 1 Liddell Patent, in which none of these changes appear and in which only the outlines of the cams K and K′ are changed from the Liddell Patent drawing.

[*Adjourned to Thursday, Jan. 7, 1904, at 10:30 A. M.*]

Thursday, Jan. 7, 1904, 10:30 A. M.

[*Met pursuant to adjournment.*]

Present—The Notary, and counsel as before.

[*Witness continues his answer.*]

A. It is nevertheless true that the reduction of the gear wheel N in relative diameter and the shortening of the leverage on the rack gear M′, through which the link *k* acts, affect the contour of the cam K favorably. And I should have referred to the reduction in the relative diameter of the gear wheel N in the machine represented by Complainant's Exhibit Drawing Liddell Paper Bag Machine Forming-plate Operating Parts, in my answer to x-Q. 497, as one feature, in addition to those I there enumerated, affecting somewhat the difference in the contours of the cam K′ inquired about in that question.

[*Defendant's counsel objects to all of the foregoing answer, except the first four sentences thereof, as bing uncalled for by the question.*]

x-Q. 507. Please to state which appears to you to be the better solution of the problem of avoiding interference and other aberrations in such a mechanism, as between the particular plan shown in Defendant's Drawing No. 13 and the particular plan shown in drawing Liddell Paper Bag Machine Forming-plate Operating Parts, those being the plans of the experts King and Lorenz respectively.

A. Broadly considered, I do not recognize any material difference between the two "plans," so-called, referred to in the question. Both show a judicious adoption of a relatively small diameter in the gear wheel N, as compared with the showing of the Liddell Patent Drawing Fig. 1, and both show a shortening of the leverage on the rack gear M′, through which the slide *k* and the cam K act in giving control to the swinging movement of the forming-plate E. The Complainant's Exhibit Drawing goes farther than Defendant's Drawing No. 13 in providing an anti-friction roller on the arm F, which is a wise provision, but does not constitute a material difference. The actual machine reperesented in Complainant's Drawing, also employs double

walled cams for the rollers (grooved or "box" cams), to insure the proper course of the rollers, while the Defendant's Drawing No. 13 shows springs to co-operate with the cams for the same purpose as that of the outer walls of the grooves in the actual machine. But these are merely mechanical variations and are not material. The cams K and K′ of the two Exhibit Drawings appear to be of different outline, but assuming the outlines of said cams in Defendant's Drawing No. 13 to be correct, as those in the actual machine are known to be, this difference is merely incidental to other differences in proportion and, being a resultant, is not an essential difference, or what I would call a difference in plan. The two designers appear to have hit upon practically the same plan, with only slight variations in proportions or angles, with, I should say, an advantage in the work of Mr. Lorenz found in the cams K and K′. I mention particularly the provision in the Lorenz cam K′ for a dwell of the forming-plate E in its receiving position, not provided in the work of Mr. King shown in Defendant's Drawing No. 13, which I here mention because obvious at a glance. A further and critical examination might discover other particulars which I do not mention.

[*Defendant's counsel objects to the whole of this answer, because it does not contain any answer to the question, and because it contains several hundred words not called for by the question.*]

x-Q. 508. Please to state what motive you had which induced you to present "Complainant's Exhibit Liddell Paper Bag Machine Two Modified Forming-plate Operating Plans" in the course of your direct-examination, and please to explain what relevancy, if any, that drawing has to this case.

A. I think the answer to this question is found, so far as I am concerned, in the statements made by me at the time I presented the drawing, in answer to x-Q. 252. Briefly repeated, such statements were that, Mr. Stone having, in his comparison of defendant's machine with the Liddell Patent, attempted to make a point of the fact that defendant's machine employs fewer parts for the operation of the forming-

plate than are shown in the Liddell Patent for that purpose, I presented this drawing, "Two Modified Forming-plate Operating Plans," to show that either of said plans could be employed in place of the particular plan illustrated in the Liddell Patent and that they severally contain fewer parts than shown in the patent "and possibly fewer than are involved in defendant's construction." I also pointed out that "from this blue print it becomes apparent that the Liddell invention is susceptible of other modifications and simplifications than those presented in defendant's machine."

x-Q. 509. It is true, is it not, that the mechanism shown in each of the two figures of this Complainant's Exhibit is faulty in showing the plate E too remote from the periphery of the cylinder C at the starting position for the edge W of the plate E?

A. I think not.

x-Q. 510. As between the mechanism shown in Fig 1 and the mechanism shown in Fig. 2 of this Complainant's Exhibit, which one do you think the better of the two? In answering this question please simply to state your conclusions without taking time to give any reason or to make any detailed comparison between the two.

A. There is not much difference between the two, but I am disposed to give the preference to the particular device of Fig. 1 of blue print exhibit in question.

x-Q. 511. Who contrived the two mechanisms shown on "Complainant's Exhibit Liddell Paper Bag Machine Two Modified Forming-plate Operating Plans"?

A. I do not know, but I judge that they came from the hands of Mr. Lorenz. Complainant's counsel submitted the blue print to me and I presume that he had caused the drawing to be made.

x-Q. 512. Did you have no conversation with Mr. Lorenz about the origin or about the character of the exhibit in question?

A. None at all.

x-Q. 513. The plans shown in the two figures of the exhibit in question were made by somebody in the latter part of 1903, were they not, and you understand, do you not, that they were

thus made by William A. Lorenz, and that he made the original drawing from which that Complainant's Exhibit blue print was taken?

A. I don't know at what date the drawing was made for this blue print, but the blue print was shown me either just before I commenced this deposition in November, 1903, or very early in the course of my direct. As I before stated, I do not know that Mr. William A. Lorenz made the drawing, but I am pretty sure that it came from his office and I judge that it was originated by him, except that he may have been instructed to make it.

x-Q. 514. I call your attention to the fact that claims 1, 2 and 7 of the Liddell Patent in suit each contains the following words: "operating means for the forming-plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder," and I ask you to state your opinion upon the following questions. Would any ordinary mechanic in endeavoring to make a paper bag machine in conformity to the Liddell Patent in suit be likely to produce the mechanism shown in Fig. 1 or the mechanism shown in Fig. 2 of Complainant's Exhibit Liddell Paper Bag Machine Two Modified Forming-plate Operating Plans? If any man in endeavoring to make a practical paper bag machine with more or less conformity to the Liddell Patent in suit, should make its operating means for the forming-plate like Fig. 1 or like Fig. 2 of said Complainant's Exhibit, would that man be exercising inventive power in so doing?

A. Answering the two queries in their order, I am of the opinion that the mechanic would very naturally adopt one or the other of the two forms or devices for controlling the movement of the forming-plate E shown in the exhibit referred to, for the primary reason that both the rocking rack co-operating with the pinion in Fig. 1 and the sliding rack co-operating with the pinion in Fig. 2 are among the most common, if they are not in fact the most common, devices for oscillating a pinion and any part connected with said pinion, know in practical machinery.

For the same reason I am of the opinion that the adoption

of these rack and pinion devices, or either of them, would not involve an exercise of inventive power.

It is to be understood that the Liddell Patent furnishes the rotating shaft carrying the cams for the up and down vibration of the curved arms supporting the pinion shaft to which the forming-plate is secured and for oscillating the pinion shaft. These being given, there is, in my judgment, after the disclosure of the Liddell Patent, no room for the exercise of anything more than mechanical skill and judgment in the adoption of the oscillating or the reciprocating rack as the means through which one of these cams shall effect the oscillation of the pinion shaft, in place of the oscillating rack M′ and the gears shown in the Liddell Patent. And, in my judgment, the adoption of either of these devices fully conforms to claims 1, 2 and 7 of the Liddell Patent in suit and falls clearly within the contemplation of the patent specification, which, after describing the particular operating means shown in the patent drawings, says at page 2, line 7:

> "In place of these devices for controlling the movement of the plate E relative to the cylinder C, the said plate may be moved or operated by any other suitable means."

[*Defendant's counsel objects to the last paragraph of the answer, as being not called for by the question.*]

x-Q. 515. Now, Mr. Dayton, if I were to cover in my cross-examination all parts of your direct-examination, and if you were to continue to volunteer the same proportion of uncalled for statements and arguments that you have done thus far in this cross-examination, it is impossible to foresee that the cross-examination could be concluded in less than about six months more. I have tried very hard to induce you to confine your answers to the questions put to you, but I have now become much discouraged in that endeavor, and have decided to omit all further cross-examination of you, except on one particular subject, not yet mentioned on the cross-examination. Before taking up that subject, I venture to ask you whether you will not now refrain altogether from your plan of loading down the deposi-

tion with long statements and arguments uncalled for by the questions put to you, and whether you will not during the rest of the cross-examination content yourself by answering the questions put, one after the other, and then stop talking until another question is put.

A. I have always refrained from saying anything in my answers which did not seem to me to be called for by the questions, and of course shall continue to do so.

x-Q. 516. Please now to look at Claussen Exhibit No. 3, and also at the Claussen Patent No. 598,497, and state whether in your opinion a competent paper bag machine designer and constructor would be likely to produce substantially such a machine as is shown in that patent, in respect of its rotating conveyor and its oscillating carrier, if he were directed to follow Claussen Exhibit No. 3 in respect of the cylinder 6 and the carrier 6a shown in that exhibit.

[*Recess.*]

A. A machine developed closely on the lines of Claussen Exhibit No. 3 would be a radically different machine from that set forth in the Claussen Patent No. 598,497, though it would have a rotating cylinder 6 carrying a pivoted peripheral section or carrier 6a. In Mr. Claussen's own development of the machine of said Exhibit 3, however, as shown in the Claussen Patent No. 574,020, the rotating cylinder 6 of the sketch did not have or carry a pivoted peripheral section, or anything else answering to the so-called carrier 6a of the sketch.

[*Defendant's counsel objects to the whole of the answer, because it does not contain any reply to the question and does contain matter foreign to the question.*]

x-Q. 517. Now, Mr. Dayton, I am very much pressed with other work, and I want to finish this cross-examination as soon as possible, and I must insist that you answer my questions as put. Please, therefore, to answer x-Q. 516, which, as you know perfectly well, is confined to the rotating conveyer and the oscillating carrier of Claussen Exhibit No. 3, and which

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you know perfectly well you did not answer nor try to answer, in reply to x-Q. 516.

A. In my opinion a competent paper bag machine designer and constructor would not be likely to produce substantially such a machine as shown in the Claussen Patent, No. 598,497, although, in closely following the suggestions of Claussen Exhibit No. 3, he would include in that machine a rotating cylinder provided with what is called the carrier 6a of said Claussen Exhibit. The machine thus developed from the sketch would, therefore, correspond with the machine of the Claussen Patent No. 598,497, with respect to the rotating cylinder and carrier. It seems to me fair to regard Claussen himself as a "competent paper bag designer and constructor," and I feel warranted in pointing out that in *his* development of the machine foreshadowed in Claussen Exhibit No. 3, he employed the rotating cylinder, but did *not* employ the pivoted carrier, and I point to his patent No. 574,020, which is the direct outcome of said Claussen Exhibit No. 3, as proof of this statement. It, therefore, appears that a competent paper bag designer and constructor will not necessarily develop a machine from Claussen Exhibit No. 3, which will contain both the rotating cylinder and the pivoted carrier.

[*Defendant's counsel calls the attention of the court to the flagrant misconduct of the present witness, in persistently evading plain questions and in volunteering misleading matter not called for by the questions put; and on this point defendant's counsel makes the following explanation to the court.*]

[*Claussen Patent No. 574,020 is not Mr. Claussen's own development of the machine of Claussen Exhibit No. 3, and neither Mr. Claussen nor anybody else except this witness ever said that it was, and x-Q. 516 contained no inquiry relative to Claussen Patent No. 574,020, and this witness had no right in pursuance of that question to bring in any statement about that patent, and particularly had no right to insert in the record the fictitious statement which he did make on that subject. The distinctive characteristic of Claussen Exhibit No. 3 is the rotating cylinder 6, with the oscillating carrier 6a, and it appears in this record that that combination of two parts*

originated with Mr. Claussen and was elaborately illustrated by him in January, 1896, when he made Claussen Exhibit No. 3, and it appears in the Claussen Patent 598,497 that that patent was particularly devoted to describing and claiming that combination, and it appears in the Claussen Patent No. 574,020 that no such combination was described or shown or claimed or in any way suggested in that patent. Now, x-Q. 516 was confined to a comparison between Claussen Exhibit No. 3 and the Claussen Patent, No. 598,497, in respect to that particular combination of rotating conveyor and oscillating carrier. This witness knows perfectly well that that combination is elaborately shown and described in Claussen Exhibit No. 3, and also in the Claussen Patent 598,497, and he knows perfectly well that it is not shown, described or claimed in the Claussen Patent 574,020, but he also knows that these facts are unfavorable to the complainant's case, and he is determined not to admit these facts if he can avoid so doing, and his plan of avoiding that admission consists in the perfectly undeniable evasions and fictions which are contained in his answers to x-Q. 516 and x-Q 517.]

x-Q. 518. Please to state whether the Claussen Patent 598497 contains a rotating conveyor and an oscillating carrier substantially like the rotating conveyor 6 and the oscillating carrier 6a of Claussen Exhibit No. 3, but with such differences as would naturally be adopted and introduced by a skilful paper bag machine designer when reducing the comparatively rough drawing of Claussen Exhibit No. 3 to such more perfect drawings as would naturally be made to be a part of an application for a patent, and when that designer really wanted to embody such a rotating conveyor and oscillating carrier in a paper bag machine, whether he wanted to follow Claussen Exhibit No. 3 in all other respects or not.

A. To make a categorical answer covering the entire question, I say that it does not.

x-Q. 519. What characteristic do you find in the rotating conveyor and oscillating carrier of the Claussen Patent 598497, which would not be likely to result from the work of a competent paper bag machine designer when he was trying to put

the rotating conveyor 6 and the oscillating carrier 6a of the Claussen Exhibit No. 3 into proper shape to do the work of clasping the forward end of the lower ply of the tucked paper tube and also clasping the lower plies of the tucks of such a tube and then moving downward as shown in Figs. 5 and 6 of Claussen Exhibit No. 3 and as shown in Figs. 16, 14 and 12 of the Claussen Patent No. 598497?

A. This question has the appearance of meaning something pertaining to the last preceding question, but in fact it does not touch the question 518, or my answer thereto. It is, therefore, necessary for me to state, for the intelligent understanding desirable for the court, that in the Claussen sketch No. 3 the forming-plate P does not co-operate with the carrier 6a, letting alone the fact that it does not co-operate with anything, in the manner or on the principle of the Claussen Patent No. 598497. It is evident from Fig. 6 of Claussen sketch No. 3 that the forming-plate P is not intended to strike upon the carrier 6a and nobody, not even Claussen himself, asserts any such intent. And it could not co-act with said carrier, because the carrier does not descend below the periphery of the cylinder, as it would need to do if the edge of the forming plate encountered it. The movement of said carrier is, as shown in said Claussen Exhibit No. 3, wholly outside the periphery of the cylinder and back to said periphery. It is true the writing on the sketch exhibit says that, if desired, the carrier may move further inward than the periphery of the cylinder, but, as the object of the inward movement of that carrier is simply to "spread the folds" of the blank and has no connection whatever with the sweeping movement of the forming-plate, this statement on the sketch in no wise militates against my above allegation. In the Claussen Patent 598497, Figs. 16, 14 and 12 show the forming-plate 75 in bearing at its creasing edge on or over the pivoted carrier 56, which is altogether contrary to the contemplation of the sketch Claussen Exhibit No. 3. This is an idea apparently taken from the Liddell Patent in suit, with the modification consisting in giving movement to a portion of the cylinder periphery, instead of to the supporting pivot of the forming-plate in giving continued coincidence of move-

ment of the edge of the forming-plate and a subjacent line on the surface of the cylinder; and it is, therefore, a difference in principle and mode of operation and not such a difference "as would naturally be adopted and introduced by a skilful paper bag machine designer when reducing the comparatively rough drawing of Claussen Exhibit No. 3 to such more perfect drawings as would naturally be made to be a part of an application for a patent, and when that designer really wanted to embody such a rotating conveyor and oscillating carrier in a paper bag machine," as it is put in x-Q. 518. This also is a characteristic which (to quote from the present question) I "find in the rotating conveyor and oscillating carrier of the Claussen Patent No. 598497, which would not be likely to result from the work of a competent paper bag machine designer when he was trying to put the rotating conveyor 6 and the oscillating carrier 6a of the Claussen Exhibit No. 3" into a paper bag machine, or into drawings representing such a machine, either for the purposes of a patent or for the purposes of working therefrom. On the other hand, I regard it as a complete and absolute departure from the scheme of Claussen Exhibit No. 3 and an appropriation of an idea underlying the Liddell invention, as set forth in the Liddell Patent in suit. As to the mere clasping of the forward end of the lower ply of the tucked paper tube and also clasping the lower plies of the tucks of such a tube, Figs. 16, 14 and 12 of the Claussen Patent No. 598497 show nothing different from, or more distinctly than, what is shown in Claussen Exhibit No. 3, these being familiar matters, partially, but adequately, shown in both the sketch No. 3 and in said figures of the Patent Drawing. As to the next following proposition and concluding part of the current question x-Q. 519, these Figures 16, 14 and 12 of the Claussen Patent Drawing show, as I have already pointed out in this answer and previously, a movement of the so-called carrier downwardly and inwardly beyond the periphery of the cylinder and in obedience to the requirements of the forming-plate, which is not shown or contemplated at all, and which is not at all required, in the different scheme of Claussen Exhibit No. 3.

[*Defendant's counsel objects to the whole of the answer, as*

elaborately and intentionally argumentative and evasive and as volunteering a eulogy of the Liddell Patent in suit, which eulogy is entirely uncalled for by the question, and entirely undeserved, if the question had called for any statement about that patent.]

x-Q. 520. Would it not have been a complete answer to x-Q. 519, and one agreeing exactly with your opinion, if you had put that answer in the following words: "There are two such characteristics. One consists in the fact that the oscillating carrier of the Claussen Patent extends much further back from the side clips than does the oscillating carrier of Claussen Exhibit No. 3, and the other consists in the fact that the oscillating carrier of the Claussen Patent oscillates inwardly from the periphery of the rotating conveyor, instead of oscillating outwardly from that periphery?"

A. I think not, because such an answer would not have made plain to the court the distinct and radical difference between the machine of Claussen Exhibit No. 3, and that of the Claussen Patent, No. 598,497, in principle and mode of operation, to which radical distinction the merely mechanical facts mentioned in the model answer now submitted to me are only incidents.

x-Q. 521. But you had no business whatever, as you know perfectly well, to talk about distinct and radical differences between the machine of the Claussen Exhibit No. 3 and the Claussen Patent, No. 598,497, in principle and mode of operation, when the question was confined to differences of structure between one part, or at most one combination of two parts of each of those machines. Now, Mr. Dayton, I consider that you are trifling with the administration of justice, violating your oath, wasting my time and conducting yourself without any excuse whatever in the manner in which you evade my questions, and I do not intend to submit to such conduct without very vigorous protest. Please, therefore, to state whether there is any difference in construction, or mode of operation, between the rotating conveyor and the oscillating carrier of the Claussen Exhibit No. 3 and the rotating conveyor and the oscillating carrier of the Claussen Patent 598,497, other than the

following two differences, namely, the oscillating carrier of the Claussen Patent extends backward from the side fingers 67 much further than does the oscillating carrier of Claussen Exhibit No. 3, and far enough to be under the lower edge of the tucker plate, instead of not being far enough to reach that lower edge. The oscillating carrier of the Claussen Patent oscillates from the periphery of the rotary conveyor inward; whereas, the oscillating carrier of Claussen Exhibit No. 3 oscillates from the periphery of the rotary conveyor outward.

A. Calling attention to the fact that this question omits the reference to what "a competent paper bag machine designer" "would be likely to do" "when he was trying to put the rotating conveyor 6 and the oscillating carrier 6a of the Claussen Exhibit No. 3 into proper shape," and also omits other parts of x-Q. 519, all which clearly justified and called for my answer to the last question, as well as my answer to the question x-Q. 519 (which omissions show that counsel recognized the injustice of the strictures with which he begins the present question), I reply to the present query that there is a difference other than those mentioned in the question, between the rotating conveyor and the oscillating carrier of Claussen Exhibit No. 3 and the rotating conveyor and oscillating carrier of the Claussen Patent 598497, namely, *a fundamental difference in operative conception and purpose*, to which the differences referred to are but incidents.

[*Adjourned to Friday, Jan. 8, 1904, at 10:30 A. M.*]

Friday, Jan. 8, 1904, 10:30 A. M.

[*Met pursuant to adjournment.*]

Present—The Notary, and Counsel as before.

[*Defendant's counsel objects to all of the preceding answer which precedes the words "I reply to the present query," on the ground, on the following grounds. The question was confined to by the question. The parenthetical statement in that part of the answer is not only not called for by the question, but is absurd and is fictitious.*]

40 [*Defendant's counsel objects to that part of the answer which begins with the words "I reply," and ends with the answer, on the following grounds: The question was confined to the differences of construction and mode of operation, whereas the answer is confined to alleged differences of conception and purpose.*]

x-Q. 522. Is there any difference in construction or mode of operation between the rotating conveyor and the oscillating carrier of Claussen Exhibit No. 3 and the rotating conveyor and the oscillating carrier of the Claussen Patent 498,497 other than the following two differences, namely, the oscillating carrier of the Claussen Patent extends backward from the side fingers much further than does the oscillating carrier of the
41 Claussen Exhibit No. 3 and far enough to be under the lower edge of the tucker plate, instead of not being far enough to reach that lower edge. The oscillating carrier of the Claussen Patent oscillates from the periphery of the rotating conveyor inward, whereas the oscillating carrier of the Claussen Exhibit No. 3 oscillates from the rotating conveyor outward?

A. There is this additional difference, that the oscillating carrier of the Claussen Patent No. 498,497 co-operates with the tucker plate, whereas in the Claussen Exhibit No. 3 it has no such co-operation with the tucker plate. This involves a different principle of operation and it is not enough, in my judgment, to merely say that the carrier extends farther to the rear and that it moves inward instead of outward from the
42 periphery. This different principle involves, *additionally*, an equal rate of advance of the tucker plate with the rate of advance of the periphery of the cylinder, and it also involves a regulated movement of the carrier inward from the periphery of the cylinder and outward again to that periphery, in order that the surface of the carrier with which the edge of the forming-plate or tucker plate co-operates shall preserve substantially the same proximity throughout the co-operative movement of the two parts, as well as substantial coincidence with a particular transverse line on the surface of the carrier.

[*Defendant's counsel objects to the whole of this answer, ex-*

cept the first sentence, on the following grounds: It is confined to talk about "principle of operation," whereas the question is confined to differences of construction or mode of operation. The word "construction" and the words "modes of operation" are concrete words, which have definite meanings, well known in mechanics and in the patent law. The words "principle of operation" are abstract words which have no definite meaning, either in mechanics or patent law, and are used by this witness to obscure and mystify the court and to evade the admission of concrete facts which are perfectly well known to him and perfectly well known by him to be unfavorable to the complainant's case.]

x-Q. 523. Now, Mr. Dayton, I am not going to endure your evasions without bitter protest, and I am not going to ask you any questions of an abstract or ambiguous character. I am going to confine my questions to concrete and undeniable facts, and I demand that you shall answer those questions concretely, and shall omit to lumber up this record with loose argument, not called for by the question, but inserted by you to bolster up the complainant's case on points, with which you have no business to interfere.

[*And now defendant's counsel moves the notary to adjourn the further taking of this deposition until Monday, Jan. 25, 1904, on grounds stated orally to the notary.*]

[*Complainant's counsel opposes the motion.*]

[*After hearing defendant's counsel in support of the motion for adjournment, and complainant's counsel in opposition thereto, the notary grants an adjournment until Tuesday, Jan. 12, 1904, at 10:30 A. M.*]

Tuesday, Jan. 12, 1904, 10:30 A. M.

[*Met pursuant to adjournment.*]

Present—The Notary, and Counsel as before.

x-Q. 524. Now please to look again at Claussen Exhibit No. 3 and state whether it does not show a rotating conveyor having

oscillating carrier pivoted thereto, and having a tucker plate vibrating on trunnions, which trunnions are not substantially on a line with the defining edge of the tucker-plate, and which tucker-plate hovers over the rotating conveyor and co-acts therewith, though it does not touch the oscillating carrier, and should not touch the rotating conveyor.

A. Understanding the word "conveyor" in the question to mean what is called the "cylinder" in the lengthy inscription in Claussen Exhibit No. 3, and recognizing a sort of co-action of the tucker-plate with the cylinder, not specified in the question, said Claussen Exhibit No. 3 does comply with the statement of the question.

x-Q. 525. Now please to state whether the tucker-plate does appear in the drawings of Claussen Exhibit No. 3, and particularly in Fig. 6 thereof, to be sure to touch the rotating cylinder or conveyor, as the tucker-plate moves forward from the position shown in Fig. 6, and also please to state whether that contact is not an illegitimate interference between the two parts, and which interference must somehow be removed to make the mechanism operative.

A. Rather, I should say, that in Fig. 6 of Claussen Exhibit No. 3 the tucker-plate appears to have already struck against the cylinder, with only the paper of the bag blank between the edge of the tucker-plate and the cylinder, as that fact would naturally be illustrated graphically, and, if it has not already done so, the tucker-plate will immediately so strike the cylinder (through the intervening paper) as the parts continue to move forward from that position. Undoubtedly, such contact of the tucker-plate with the cylinder is an illegitimate interference, which makes the machine inoperative, and which must be removed or remedied, in order to make the mechanism operative.

x-Q. 526. Now please to look at the left hand column of figures in Defendant's Drawing No. 9, and state whether that column of figures does not show the same mechanism as Claussen Exhibit No. 3, in more stages of operation, and with the outline of Fig. 6 completed in each of four figures of the column; except that the interference you speak of is remedied in

that column of figures in Defendant's Drawing No. 9, and is remedied by cutting back to the backwardly inclined surface that rear surface of the recess in the cylinder 6, which is shown in Claussen Exhibit No. 3 to be substantially radial to that cylinder. To illustrate exactly what I mean by the suggested cutting back of the rear side or surface of that recess, I ask you to compare Fig. 6 of Claussen Exhibit No. 3 with Fig. 2 of the left hand column of figures in Defendant's Drawing No. 9, in the last of which figures you will see a clear space under the lower edge of the tucker-plate P and under the paper below that edge, and above the adjacent rear side of the recess in which the oscillating carrier 6a is located, and which clear space results from cutting back the rear side or surface of that recess from a right angle to the periphery of the cylinder Fig. 6 of Claussen Exhibit No. 3 to an angle of about 70° from that periphery.

A. The left hand column of figures in Defendant's Drawing No. 9 does show the same mechanisms as Claussen Exhibit No. 3, in more stages of operation, and with not only the modification stated in the question, but with the additional modification of projecting the cam horn 8 farther outward. But it is not true that the interference referred to in the last question and answer, as apparent in the Claussen Exhibit No. 3, is thereby remedied. It is only so far remedied as to allow the tucker-plate P to advance beyond its interfering position shown in Fig. 6 of Claussen Exhibit No. 3, and the tucker-plate will still interfere with the cylinder or conveyor, of the left hand column of Defendant's Drawing No. 9, on the return movement of said tucker-plate, as is clearly apparent from Figs. 2 and 3 of Drawing No. 9. In other words, the recess in said Drawing No. 9 is sufficiently lengthened to let the tucker-plate swing forward, but no provision is made for letting the plate swing backward.

x-Q. 527. Now suppose the mechanism of the left hand column of Defendant's Drawing No. 9 to be developed still further by the addition of a duplicate carrier and its recess in the periphery of the cylinder 6, and the placing of that duplicate carrier and recess on the opposite side of that cylinder; it would

result, would it not, in a necessity for two additional recesses for the accommodation of the tucker-plate P during the two backward strokes which it would make in co-operating with a cylinder 6, thus provided with two rotating carriers 6a; and those two additional recesses would naturally be made, would they not, in the priphery of the cylinder, diametrically opposite to each other, and each of them would be somewhere between the two recesses occupied by the two carriers 6a, on the one hand, or, on the other hand, would the backward movement of the tucker-plate P be provided for by enlarging the two recesses occupied by the carriers respectively?

A. The application of a second carrier to the cylinder or conveyor (necessarily at a point opposite the present one) gives two recesses in the cylinder for the two carriers and for the forward swing of the tucker-plate. The addition of two additional and intermediate recesses will accommodate the tucker-plate in its return movement.

x-Q. 528. Now please to look at Claussen Exhibit No. 5 (which is the original Claussen pencil sketch of Nov. 6, 1895) and please to look at Claussen Exhibit No. 6 (which is an inked copy made on tracing cloth of Claussen Exhibit No. 5, with the addition of certain letters of reference), and state whether Claussen Exhibit No. 5 does not show a rotating conveyor having an oscillating carrier pivoted thereto, and having a tucker-plate vibrating on trunnions, which trunnions are not substantially on a line with the defining edge of the tucker plate, which tucker plate hovers over the rotary conveyor and co-acts therewith, though it does not touch the oscillating carrier, and should not touch the rotating conveyor?

A. Claussen Exhibit 5-6, being unaccompanied by any description, is in many respects exceedingly vague as to what it is intended to show. Some of the circles apparently represent feed rolls, while others apparently represent only gear wheels. One of the others, to wit, that marked 6, is assumed to represent a cylinder, being referred to in the question, as I understand it, by the word "conveyor." I understand the part marked "6a" to be what is called a carrier, and it is obviously similar to the carrier 6a of Claussen Exhibit No. 3. I also understand the

part P of Claussen Exhibit 5-6 to be a vibratory tucker plate, corresponding to the part P of Claussen Exhibit No. 3, mounted on trunninos remote from its defining edge and swinging at its edge through a half circle below its trunnions, first forwardly, or to the right, and then backwardly, or to the left, to the starting position shown in Claussen Exhibit No. 5-6. It is clearly evident that said tucker plate is not intended to touch on or to strike downwardly opposite the carrier 6a, and it is also evident that it cannot be permitted to strike the cylinder, because then it would be arrested and would not operate.

x-Q. 529. It is true, is it not, that Claussen Exhibit No. 5-6 shows substantially the same mechanism as Claussen Exhibit No. 3, with some differences of detail, including the difference which consists in the fact that the carrier 6a in Claussen Exhibit No. 5-6 oscillates inward from the periphery of the cylinder 6 and back again to that periphery, whereas the carrier 6a of Claussen Exhibit No. 3 oscillates outwardly from the periphery of the cylinder 6 and back again to that periphery?

A. It is evident, I think, in view of the more mature, though still incomplete and still unperfected drawing of Claussen Exhibit No. 3, that Claussen Exhibit No. 5-6 and Claussen Exhibit No. 3 relate to the same intended machine, there being certain features not referred to in the question which distinctly identify them, with respect to their main characteristics. There are differences, one of which consists, as stated in the question, in the fact that the carrier 6a in the Claussen Exhibit No. 5-6 oscillates inwardly from the periphery of the cylinder and back again, whereas the carrier 6a of Claussen Exhibit No. 3 oscillates outwardly from the periphery of the cylinder 6 and back again.

x-Q. 530. Now I inquire whether the following does not appear in the defendant's evidence to be a substantially correct account of some of the doings of Edward E. Claussen in paper bag machinery?

On Nov. 6, 1895, Mr. Claussen contrived the mechanism shown in Claussen Exhibit No. 5-6, and on that day he made Claussen Exhibit No. 5 to delineate that mechanism in a first pencil sketch.

On Jan. 17, 1896, he finished Claussen Exhibit No. 3, which he had started on Nov. 23, 1895, and that Claussen Exhibit No. 3 was a more mature, though still incomplete, drawing in ink and in colors of the mechanism of Claussen Exhibit No. 5, and that more mature drawing was furnished with a long written inscription upon its face and was dated and witnessed by Mr. Des Jardins on Jan. 17, 1896.

When Mr. Claussen came to make patent office drawings, with a view to secure exclusive rights in the machinery which he had invented and had shown in Claussen Exhibit No. 5, in November, 1895, and in Claussen Exhibit No. 3, in January, 1896; he did decide to divide that mechanism between two separate applications for patents, putting part of it into one application, in connection with mechanism not shown in Claussen Exhibit No. 3 or Claussen Exhibit No. 5, and putting part of that original mechanism into another application, in connection with still other mechanisms not shown in Claussen Exhibit No. 5 or Claussen Exhibit No. 3. In pursuance of this decision of his, Mr. Claussen put the rotating conveyor or cylinder 6 and the oscillating carrier 6a, and the front gripper and side grippers on that carrier, and also the tucker plate P, oscillating upon a trunnion not substantially in line with its defining edge and hovering over the cylinder 6, into an application which he filed July 29, 1896, and which was numbered 600,861, and which resulted in the Claussen Patent 598,497, on Feb. 8, 1898. And in pursuance of this decision of his, Mr. Claussen inserted in his application No. 599,609, which he filed July 19, 1896, and which resulted in the Claussen Patent 574,020 on Dec. 29, 1896, the following mechanism, taken out of Claussen Drawings Nos. 5 and 3, namely, the V plate, having the triangular parts 11 and 12 of Claussen Exhibit No. 3, and the clip 16-16, operating to turn over certain parts of the paper upon the upper surfaces of those triangular parts of that V plate.

And it is thus true, is it not, that the machine of the Claussen Patent 598,497, had its origin in the Claussen Exhibit No. 5, in the sense that its rotating conveyor or cylinder and its oscillating carrier are clearly traceable back to Claussen Ex-

hibit No. 5 through Claussen Exhibit No. 3; while it is also true that the machine of Claussen Patent, No. 574,020 had its origin in Claussen Exhibit No. 5, in the sense that its V plate and the turning fingers co-operating therewith are clearly tracaeble back to Claussen Exhibit No. 5 through Claussen Exhibit No. 3.

I do not in this question attend to anything which appears in either of the two patent applications and which does not appear in Claussen Exhibit No. 3 or Claussen Exhibit No. 5, because the question is long enough already.

[*Recess.*]

[*Complainant's counsel objects to above question as a statement by defendant's counsel of the opinions of defendant's counsel as to what certain testimony in the case means or proves and a request to the witness to give his opinion of what said testimony proves, in respect to matters largely of fact; therefore, the question is objected to as incompetent.*]

A. Answering this question so far as I am able, in the nature of things, to do so, and treating the sketches referred to as themselves constituting a material part of defendant's testimony relating to this subject, I should say that on Nov. 6, '95, Mr. Claussen had some mental glimmerings or partial conceptions of a paper bag machine, for making a new and particular kind of bag, which, though to be made from a tucked paper tube, was to be a different bag from the regular self-opening square-bottom bag, known as the Deering bag, and which was to be made by a new process, which he had already conceived and which is referred to in the title appearing at the lower right hand corner of Claussen Exhibit No. 3 as "Process (Case A) dated Nov. 4, '95"—such glimmerings or partial conceptions being graphically expressed on Nov. 6, 1895, in Claussen Exhibit No. 5.

I should say further that, on Jan. 17, 1896, Claussen had so far advanced with his idea for making the new process bag by machinery as is indicated in Claussen Exhibit No. 3, bear-

ing that date, this drawing Claussen Exhibit No. 3 having been begun (as stated thereon) on Nov. 23, 1895.

To my mind it is evident that the distinguishing feature of this new process machine of Claussen Exhibit No. 5-6 and Claussen Exhibit No. 3 is that feature of it which distinctly pertains to the production of the new process bag, and this distinguishing feature of the machine, it seems to me, is clearly the stationary V plate 10, with its V projections 11 and 12, as delineated in Fig. 1 of said Claussen Exhibit No. 3, together with the fingers 16-16 for turning the end of the upper ply over the projections 11 and 12 of the V plate.

When Mr. Claussen came to make patent office drawings with a view to secure exclusive rights in this new process machine, foreshadowed in Claussen Exhibit No. 5, and more fully worked out in Claussen Exhibit No. 3, he does not appear to have decided to divide that mechanism between two separate applications for patent, for there is no patent to show that he had any purpose to take out more than one patent on that machine. And the Claussen Patent No. 574020 is the only patent applied for by Claussen, so far as this record shows or so far as I am aware, setting forth any construction of machinery for making said new process bags. In this patent No. 574020 Claussen retains the essential characteristic of the sketches Claussen Exhibit No. 5-6 and Claussen Exhibit No. 3, consisting in the V plate and its accompanying fingers, by which the peculiar feature of the new process bag was made. He does not, however, in the drawings for said patent, continue to show the oscillating carrier on the rotating cylinder, which, in the two sketches referred to, he had previously shown, but on the other hand, employs a plain rotating cylinder and adopts the idea which the Liddell Patent in suit discloses (and which patent Mr. Claussen testified that he had seen) of movably supporting the vibratory tucker-plate on arms carrying the trunnions of said plate and vibrating towards and from the cylinder. Thus, in my judgment, Mr. Claussen demonstrated that the oscillating carrier on a rotating cylinder was not an essential of his new process bag machine, but that the V plate and its accompaniments were essentials of that machine and

requisite to the formation of his new process bag. So far as the new process bag machine or V plate machine was concerned, it seems to me that the oscillating carrier shown in the sketches preceding the patent office drawings for this machine, appears to have been abandoned or discarded.

I think the evidence further shows that Claussen, between the date (Nov. 5, 1895) of producing the sketch Claussen Exhibit No. 5 and the date of taking up further work on the subject of that sketch, on Nov. 23, 1895, had another vague and partial idea for a machine for making the old Deering bag, which idea, so far as it shaped itself in his mind, he represented in Claussen Exhibit No. 1 (of which Claussen Exhibit No. 2 is a lettered tracing) on Nov. 22, 1895. In this sketch Claussen Exhibit No. 1-2 no rotating cylinder is shown and no bed of any sort is shown, and Claussen testifies in answer to direct-question 116, on page 36 of D. P. R.:

> "I don't really remember what kind of bed I should have used at the time; for if I had had any idea, I should have indicated it on the sketch."

There is, therefore, no authority in defendant's testimony, in my judgment, for identifying the rotary cylinder or conveyor and its oscillating carrier of the other two Claussen sketches in any way or manner with what Claussen shows in said Claussen Exhibit No. 1-2.

But it appears that after filing his application for the new process or V plate machine, shown in Patent No. 574020, Claussen filed another application for Patent No. 598497, in which he shows and describes a rotating cylinder or conveyor having an oscillating carrier, or pivoted peripheral section, and that with this carrier and cylinder he combines the vibratory tucker-plate of his sketch Claussen Exhibit No. 1-2, but in a way entirely unlike that in which these parts are combined or employed in the other two sketches, Claussen Exhibit No. 5-6 and Claussen Exhibit No. 3. Moreover, the combination of the vibratory tucker-plate having its axis remote from its creasing edge with the cylinder and its carrier, in this Patent No. 598497, happens to correspond with the particular way in

which the Liddell Patent had shown to Claussen how such a tucker-plate could be combined with a continuously rotating cylinder or bed.

I do not regard this Claussen Patent No. 598497 as representing a division of the Claussen sketches Nos. 5-6 and 3, but as a separate and distinct construction, embracing a combination and mode of operation nowhere foreshadowed in any one of or in all three of the Claussen sketches. And said Claussen Patent No. 598497 is, in my opinion, the first disclosure by Claussen of any device or machine made or conceived or sketched by him, containing the feature of a tucker-plate vibrating or rotating upon an axis remote from its edge, and co-operating at that edge with a continuously advancing or rotating bed of any kind whatever.

It is thus not true, in my judgment, that the machine of the Claussen Patent No. 598497 had its origin in the Claussen Exhibit No. 5, in any sense, although it is true that its rotating cylinder or conveyor having an oscillating carrier forming part of its periphery is, as an individual detail, traceable back to said Claussen Exhibit No. 5 through Claussen Exhibit No. 3. And it is true, in my judgment, that the origin of the new process machine or V-plate machine of Claussen Patent No. 574020, so far as the V-plate and the turning fingers co-operating with them are concerned, is clearly traceable back to Claussen Exhibit No. 5 through Claussen Exhibit No. 3.

But, so far as the machine of the Claussen Patent 574020 or the machine of Claussen Patent No. 598497 is concerned, as it finally appears in the patent showing and describing it, each shows something more and something different from what Claussen had shown in either of his three sketches, and that such additional and different something came from the Liddell Patent in suit.

Mr. Claussen does testify, in answer to r-d-Q. 413 (page 110, D. P. R.) that the device which adapts the machine of Exhibits 3 and 5 to make the new process paper bag like Claussen Exhibit No. 4 is:

"Principally the Vee plate, the tucker plate, the carrier, pivoted to the conveyor, the front clip 19 and the side clip 20."

I think the incorrectness of this answer is conclusively shown by Claussen Patent No. 574,020, in which the carrier, pivoted to the conveyor, is not present at all.

Mr. Claussen also testifies on the next page, in answer to r-d-Q. 417, that "The oscillating carrier" is considered by him to be the most distinguishing characteristic of each of the square bottom paper bag machines of the Continental Paper Bag Company; but as an obvious fact, the oscillation of the carrier or section of the cylinder periphery is for the sole purpose of accommodating the swing of the tucker plate having its supporting axis remote from the creasing edge, which edge opposes said oscillating portion of the cylinder periphery. Hence, it appears to me, that Mr. Claussen is wrong in this answer, as well as in the other, the "most important distinguishing characteristic" of each of said machines being said tucker plate so mounted and calling for the oscillation of the peripheral section (in this form of combination and mode of cooperation of the plate with the cylinder surface), rather than the oscillating carrier which is only the thing called for by the tucker plate. Besides, in neither of the Claussen sketches, Nos. 5-6 and 3, showing the pivoted carrier or peripheral section, is the movement of that carrier or section called for by the tucker plate, because the tucker plate does not oppose the carrier but at best, only opposes a notch or recess in the cylinder.

[*Adjourned to Wednesday, Jan. 13, 1904, at 10:30 A. M.*]

Wednesday, Jan. 13, 1904, 10:30 A. M.

[*Met pursuant to adjournment.*]

Present—The Notary, and Counsel as before.

x-Q. 531. Now you have fully explained your views of the relations between the Claussen Patent 574,020 and the Claussen Exhibits 5-6 and No. 3; but hereafter I desire to confine

your attention to the relations between those Claussen Exhibits and the Claussen Patent 598,497. On this point, as you understand, the question is to what extent, if at all, that Claussen Patent 598,497 is entitled to take date, in point of origin of invention, from the Claussen Exhibit 5-6, it already having been agreed between us, as I understand, that the Claussen Exhibit 5-6 represents substantially the same mechanism as that of the Claussen Exhibit No. 3.

Now coming to compare Claussen Patent 598,497 with the Claussen Exhibit 5-6, I have no desire to ignore any existing difference between them, but I do desire to develop on the record the mechanical facts relevant to such similarities and differences as appear to be noteworthy in this case. Proceeding with this view, I ask you now to compare Claussen Exhibit No. 5-6 with the drawings of the Claussen Patent 598,497, and particularly with Figs. 6, 8, 10, 12, 14 and 16 of those drawings, and state whether the combination of the rotating conveyor and an oscillating carrier having its forward end pivoted to the conveyor and mechanism to oscillate the carrier upon its pivot, and a tucker plate vibrating upon trunnions not substantially on a line with its defining edge, would be present in substantially the same form in Claussen Exhibit 5-6 and in the drawings of the Claussen Patent No. 598,497, if the carrier 6a of Claussen Exhibit 5-6 were about 50% longer than it is shown in that Exhibit, and if that added length were to consist in simply prolonging the rear end of that carrier about half an inch on the scale of the drawing of that exhibit, so that the rear edge of the upper surface of the carrier were somewhat further back than the rear edge of the tucker plate P, instead of being, as it is, considerably further forward than that rear edge.

A. If the sketch Claussen Exhibit No. 5 had shown the carrier or pivoted peripheral section of the assumed cylinder, (which section has been marked 6a in Claussen Exhibit No. 6), a half an inch longer in the direction referred to in the question, without other change, said sketch would have shown the carrier in substantially the same relation to the tucker plate as it is shown in Figs. 6, 8, 10, 12, 14 and 16 of the Claussen

Patent 598,497. But this would not be sufficient in itself to give the same entire combination that is shown in said figures of the Claussen Patent Drawings, if this be the proposition of the question. There would be the rotating cylinder or conveyor, an oscillating carrier, forming part of the cylinder periphery and pivoted to the cylinder, a cam mechanism to oscillate the carrier upon its pivot and a tucker plate vibrating on trunnions not substantially on a line with its defining edge, and these parts would then be severally and substantially the same form and associated in substantially the same relations to each other in the sketch as in the said figures of the Claussen Patent No. 598,497. It is to be understood that we are now reading Claussen Exhibit No. 5 in the light of Claussen Exhibit No. 3 and the explanations given upon the latter and in the testimony of Claussen concerning said No. 5 exhibit.

x-Q. 532. Your last answer is perfectly clear and entirely fair, and it carries forward the cross-examination almost to its end. But I still desire to ask a few questions on other points relevant to the comparative character of the Claussen Patent 598,497 and the Claussen Exhibits 5-6, 3 and 1-2. With this view I inquire of you whether the front clip 61 of the Claussen Patent 598,497 is not found in the front clip 20 of the Claussen Exhibit No. 5-6 and in the front clip 19 of Figs. 5 and 6 of the Claussen Exhibit No. 3.

A. It is.

x-Q. 533. Next I inquire if the side clips 67 of the Claussen Patent 598,497 are not found in the side clips, one of which is shown in Claussen Exhibit No. 5-6 on the side of the carrier 6a and which is designated in Claussen Exhibit No. 6 by the numeral 20 in the main figure of that exhibit, and which is designated by the numeral 20 in the end view at the left hand end of Claussen Exhibit No. 6 in the place where that numeral is employed under the bag blank; and I also inquire whether those side clips 67 of the Claussen Patent No. 598497 are not found in the side clips which are designated by the numeral 20 in Fig. 2, Fig. 3 and Fig. 6 of Claussen Exhibit No. 6, and which side clips are designated by the numerals 18 and 20 respectively in Fig. 1 of Claussen Exhibit No. 3 and

are designated by those numerals in the inscription written on the face of Claussen Exhibit No. 6.

A. That is true of the side cylinder clips.

x-Q. 534. It is true, is it not, that the side clips 83, which are mounted on the tucker-plate 75 in the Claussen Patent 598497, are absent from Claussen Exhibit No. 5-6 and are also absent from Claussen Exhibit No. 3?

A. That is true, and they are intentionally absent from these Claussen Exhibits, as having no part in the construction contemplated therein.

x-Q. 535. Now suppose that a paper bag machine expert acquainted with the prior art and having Claussen Exhibit No. 5-6 and Claussen Exhibit No. 3 before him should decide that the V plate and the turning fingers of those exhibits were undesirable, because resulting in a paper bag like Claussen Exhibit No. 4, instead of the older bag like Claussen Exhibit No. 7 (which you have called the Deering bag); it would be apparent to that expert, would it not, that he could adapt the machine of Claussen Exhibit No. 5-6 and Claussen Exhibit No. 3 to the manufacture of such bags as Claussen Exhibit No. 7, by simply omitting the V plate and the turning fingers on the V plate, and by adding to the tucker-plate P a pair of oppositely disposed bevel edged side nippers like those indicated by the numeral 83 in the Claussen Patent No. 598497?

A. It would not, first, for the reason that the changes referred to, would not accomplish the object.

x-Q. 536. What other change or changes would have to be made in the machine of Claussen Exhibit No. 5-6 and Claussen Exhibit No. 3 to adapt that machine to make the Deering bag of Claussen Exhibit No. 7?

A. There would be necessary, as evidenced by the Claussen Patent 598497 and by defendant's machines, the combination and arrangement of the tucker-plate to co-act with the carrier by opposing its creasing edge to that carrier, instead of opposing it to a notch or recess in the cylinder behind the carrier, and it would be further necessary, as also evidenced by the said Claussen Patent and defendant's machine, to control the movement of the carrier inwardly from the periphery

and outward thereto corresponding with the arc through which the edge of the tucker-plate sweeps. The former necessity will be met by prolongation of the carrier, but the provision for the proper control of the movements of the carrier, first inward from the periphery of the cylinder, and then outward to the periphery, would call for a special construction of the cam 8 of Claussen Exhibit No. 5-6. In other words, there would be a necessity for a new conception of construction and mode of operation.

[*Recess.*]

[*Defendant's counsel objects to the last sentence of the foregoing answer, as being a voluntary abstract statement not called for by the question and not proper to be sworn to at all.*]

[*Defendant's counsel states to the court that he has informally told the witness and complainant's counsel during the recess that he desires to confine the cross-examination to concrete facts and to leave the argument as to the significance of those facts to counsel and to leave the decision as to the significance of those facts to the court, and defendant's counsel has respectfully requested complainant's counsel to advise the witness to confine his answers to the concrete facts inquired of, and that complainant's counsel has declined to join in giving that advice to the witness, and the witness has declined to promise to confine his answers to the territory suggested by defendant's counsel. For these reasons, the defendant's counsel is compelled to relinquish his hope of concluding the cross-examination very soon, and finds it to be his duty to extend the cross-examination somewhat indefinitely, in order to show thereby that the witness is in error in saying that the changes concretely specified in the first part of his answer to x-Q. 536 would involve a necessity for a new conception of construction and mode of operation.*]

x-Q. 537. Now please to look at Claussen Exhibit 5-6, and compare it with the Claussen Patent 598497, and state in what respect the cam 8 of Claussen Exhibit No. 5-6 would have to

be changed in construction, in order to cause the carrier 6a not only to oscillate inward from the periphery of the cylinder and back again thereto (as it is shown in Claussen Exhibit 5-6), but also to cause that carrier to thus oscillate in exactly correct time with the forward sweep of the tucker-plate P, if the carrier 6a were prolonged about 50% so that that carrier would have to oscillate inward from the periphery of the cylinder in proper time to permit the tucker-plate P to pass forward during its oscillation and with its edge adjacent to the upper surface of the carrier 6a.

A. I do not pretend to be able off-hand to graphically point out exactly the shape of the cam necessary to the operation of the carrier in connection with the tucker-plate, as referred to in the question, but simply state that now said cam is required only to have a shape suitable for the spreading of the folds of the bag, and not to exactly follow the edge of the tucker-plate. Wherefore, although the cam dips at approximately the right place and has the same general shape of concavity, in the sketch Claussen Exhibit 5-6 that it would have in the different supposed co-operative relation of the tucker-plate with the carrier, the cam as shown in the sketch manifestly does not indicate the outline that would need to be given it in such different arrangement and mode of combination.

x-Q.538. I will undertake off-hand to graphically point out the shape which the cam 8 must have, in order to cause the carrier 6a to do what is specified in x-Q. 537, and I will undertake to formulate a correct answer to that question, and I will ask you to state whether my answer is in accordance with what shall then appear to you to be the facts; hence I proceed as follows:

An off-hand sketch like Claussen Exhibit 5-6 is to be interpreted according to the logic of the situation. Coming to interpret that sketch according to that logic, I find that cylinder 6 revolves in a clockwise direction and that the cam 8 does not revolve or move in any direction. That cam is evidently intended to be concentric throughout its outline except in the concavity between its two horns, and which concavity occupies about 60°, or one-sixth of the periphery of the cam. There

is the same occasion for the carrier 6a to begin to move toward the axis of the cylinder 6 at the same instant that the tucker-plate P begins to move forward, where the carrier 6a is short, as in Claussen Exhibit No. 5-6, that would exist if that carrier were 50% longer, as it is in the Claussen Patent 598497. The concavity in the cam 8 is in the right place and is of the right depth to permit that downward movement of the carrier 6a, while the cylinder 6 is turning forward from the position occupied by it in Claussen Exhibit No. 5-6, whether that carrier is to be a short one, as in Claussen Exhibit No. 5-6, or is to be a long one, as in the Claussen Patent No. 598497. Where that carrier is to be a long one, the downward movement of the carrier must be timed so as to harmonize with two necessities. One of those necessities resides in the necessary harmony of movement between the side clips of the carrier and the face of the tucker-plate; and the other necessity resides in the necessary harmony of movement between the upper surface of the carrier 6a and the edge of the tucker plate. These two harmonies of movement are harmonious with each other, so that whatever downward movement of the carrier 6a (if it is a long carrier) would be harmonious with the edge of the tucker plate P' would also be harmonious with the face of that tucker plate. On the other hand, it is possible that if the carrier 6a is to be a short carrier, some deviation from a proper movement of the cam 6a would be tolerable, which would not be tolerable if the carrier 6a were to be a long one, but that deviation, even if tolerable, would not be desirable, and is evidently not intended to exist, for reasons which I will not take time to state in detail. On the whole, I conclude that the cam 8 is almost exactly correct in outline to control the movement of the carrier 6a inwardly from the periphery and outward thereto to corespond with the arc through which the tucker plate sweeps, whether the carrier 6a is to be a short one, like that shown in Claussen Exhibit No. 5-6, or is to be a long one like that shown in the Claussen Patent 598497.

Now I have formulated and dictated this explanation of the subject in x-Q. 538 in thirteen minutes by my watch, and therefore I have not wasted any time in so doing. You have

heard it as I have dictated it, and now I ask you to state wherein, if at all ,that explanation is incorrect?

A. There are several fallacious statements in the question, but the best answer to the entire proposition is found, I think, in the maturer sketch Claussen Exhibit No. 3, where the tucker plate and the carrier are both shown in more than one position. In Fig. 6 of Claussen Exhibit No. 3 the carrier 6a is shown in its innermost position, while the edge of the tucker plate P has not reached its lowermost position, but has descended as far as the carrier can or is intended to descend, namely, into line with the periphery of the cylinder. Fig. 3 in column 1 of Defendant's Drawing No. 9 shows the tucker plate P with its edge at its extreme point of depression toward the center of the cylinder, as Fig. 6 of Claussen Exhibit No. 3 indicates it would be if the cylinder were cut away to let the tucker plate further inward. If the carrier 6a were prolonged to reach under the tucker plate, it would therefore need to drop materially farther inward than it is shown to do in said Fig. 6 of Claussen Exhibit No. 3, because it must in that case be beneath the tucker plate.

I consider it quite immaterial whether or not the rude sketch Claussen Exhibit No. 5-6 happens to show a concavity approximately or exactly suitable for the control of the carrier if prolonged to extend under and to co-operate with the tucker plate, because it would be a mere accident if that were so. And that Claussen had no such intention, and that there exists no such necessity, is shown by the fact that in the maturer sketch Claussen Exhibit No. 3 the carrier 6a, after it has descended to "open the fold of the bag blank, does not rise at all with the backward rise of the edge of the tucker plate, but continues in its lowermost position almost the entire way around the cam and is thrown out only just in time to elevate the carrier into position to engage the next blank with its side clips.

[*Defendant's counsel objects to the whole of the answer, because it is confined to an interpretation of Claussen Exhibit No. 5-6 of Nov. 6, 1895, as if Claussen Exhibit No. 3 of Jan. 17, 1896, was a copy of Claussen Exhibit 5-6, but more mature*

in details; whereas, there is an important difference between Claussen Exhibit No. 5-6 and Claussen Exhibit No. 3, which renders it impossible to answer x-Q. 538 as if that question had referred to Claussen Exhibit No. 3, instead of being confined to Claussen Exhibit No. 5-6.]

[*Defendant's counsel objects to the whole of the answer to x-Q. 538, because it is confined to an exposition of drawings not mentioned in that question, and does not contain any statement relevant to the drawing which is mentioned in that question, except the statement that it is immaterial whether that drawing shows a cam exactly or approximately suitable for the control of the carrier 6a if that carrier is prolonged to extend under and co-operate with the tucker plate.*]

[*Defendant's counsel calls the attention of the court to the fact that the explanation set forth in x-Q. 538 shows that that cam is approximately or exactly suitable for that purpose, and calls attention to the fact that the answer to that quesion does not controvert that proposition, but does say that it is immaterial.*]

[*And defendant's counsel lastly calls attention of the court to the fact that it has thus been established that no special construction of the cam 8 of Claussen Exhibit No. 5-6 other than the construction shown in that Exhibit is necessary to adapt that cam to control the carrier 6a, if elongated harmoniously with the edge of the tucker plate P, and that therefore the witness was in error in saying in the last sentence of his answer to x-Q. 536, after asserting a necessity for a special construction of the cam 8, "In other words, there would be a necessity for a new conception of construction and mode of operation," unless that alleged necessity was not intended to refer to the alleged change stated immediately before that alleged necessity was stated in that answer, but was intended to refer to the earlier stated necessity for making the edge of the tucker plate oppose its creasing edge to the surface of the carrier, which latter is grammatically a forced construction of the answer to x-Q. 536.*]

[*And now defendant's counsel submits to the court that this exposition of the unsoundness of the argumentative and*

abstract last sentence of the answer to x-Q. 536 shows the entire impropriety of the course of the witness in departing from the concrete points inquired of and swearing to argumentative conclusions, which, however plausible upon their faces, cannot endure examinations long enough to point out their errors.]

x-Q. 539. Now, Mr. Dayton, the differences between the following combination as it appears in the Claussen Patent No. 598,497, and as it appears in the Claussen Exhibit 5-6 have been undeniably reduced by our debate to two particulars, and I desire to participate with you in showing to the court the concrete character of those two particulars. The combination to which I refer is the combination referred to in Claim 2 of the Claussen Patent No. 598,497, in the following words:

> "The combination of the conveyor; an oscillating carrier, pivoted to the conveyor; mechanism to oscillate the carrier upon its pivot, and a tucker plate vibrating upon trunnions not substantially on a line with its defining edge; all co-operating during the forward movement of the conveyor, and during both parts of the oscillation of the carrier, and during the vibration of the tucker plate, to unfold a paper tube and to refold it into a paper bag blank."

The two differences between that combination as it appears in Claussen Patent No. 598,497, and as it appears in the Claussen Exhibit No. 5-6 are the following: First. The carrier 6a of the Claussen Exhibit No. 5-6 extends backward some distance from the side clips *a*, but that carrier extends much further backward in the Claussen Patent 598,497, so that in the mechanism of the Claussen Exhibit No. 5-6 the edge of the tucker plate P impinges upon the paper stretched over a recess in the rear of that carrier, instead of impinging upon the same paper resting upon the rearward extension of that carrier, which latter is the fact in respect of the Claussen Patent 598,497. Second. The paper is held against the forward face of the tucker plate P in the mechanism of Claussen Exhibit 5-6 by the joint operation of the turning fingers *b* and the V plate *y*,

whereas the paper is held against the same tucker plate in the Claussen Patent 598,497 by means of the side clips 83 pressing directly upon that tucker plate, instead of by the indirect means of the turning fingers and the V plate as in Claussen Exhibit No. 5-6.

Now I ask you to state whether, in view of the prior art, (such as the Lorenz and Honiss Patent 337,966), it involved invention for Edward E. Claussen to add the side clips 83 (as he did in the Claussen Patent 598,497), to the tucker plate P of the Claussen Exhibit No. 5-6, as a substitute for the turning fingers *b* and the V plate *y* of that exhibit.

I do not ask you to review any part of this x-Q. 539, except the last paragraph, because all preceding it is already established in the case to my entire satisfaction, and I do not wish to take time to go over that matter again, and I insert it in the question only to show you by exclusion the limits of the inquiry put to you.

[*Adjourned to Thursday, Jan. 14, 1904, at 10:30 A. M.*]

Thursday, Jan. 14, 1904, 10:30 A. M.

[*Met pursuant to adjournment.*]

Present—The Notary, and Counsel as before.

A. Dissenting altogether from the opening statement of the question, as being without basis in fact or in reasonable inference, I reply to the actual query to which I am limited, and which is expressed in the last paragraph but one of the question, by saying:

First. The question cannot be dissociated, as counsel requests, from the erroneous assumptions and specious and unsound arguments by which counsel has led up to the question, and which counsel has, in part, incorporated in the question by directing them to me personally and by name in the opening line of the question, and, for the rest, by his so-called objections, which are brought into the question by making them the basis of the erroneous allegation of the first sentence of the

question. Under this head I briefly state that after a few measurements I find that the cam 8 of Claussen Exhibit No. 5-6 is neither exactly nor approximately suited to give such a movement to the carrier 6a that, if that carrier were prolonged to extend beneath the edge of the tucker plate, it would properly co-operate with that edge of the tucker plate, as counsel assumes in the question on the ground that I did not specifically deny it in my last answer. Although the concavity in said cam 8 in said sketch is in the neighborhood of the right place, it does not either begin or end at the right point and is not of the right depth. Particularly it is characterized by the same feature which characterizes the longer depression of the cam in the more mature sketch of the same device shown in Claussen Exhibit No. 3, wherein there is no pretense of any attempt to give an inward and outward movement to the carrier corresponding with the movement it would need to have if prolonged beneath the tucker plate to co-operate therewith in the manner specified in Claim 2 of the Claussen Patent No. 598497, quoted in the question, and which contemplates such co-operation of the carrier with the tucker plate in the words:

> "All co-operating during the forward movement of the conveyor, and during *both parts of the oscillation of the carrier,* and during the *vibration of the tucker plate.*"

The words which I have underscored in the above quotation from the claim, being used in said Claussen Patent with reference to a construction and combination, and especially in connection with a co-operative relation of the tucker plate with the carrier, which the Claussen sketch No. 5-6 and even the Claussen sketch No. 3, in no wise indicates or foreshadows, but which is first shown by Claussen in said patent after having been previously shown in the Liddell Patent in suit, indicate the distinct idea of a movement of the carrier whereby the edge of the tucker plate is kept in a permanent relation to the surface of the carrier "during both parts of the oscillation of the carrier and during the vibration of the tucker plate." These words cannot be made to apply to anything shown in said Claus-

sen Exhibits or either of them, as the quotation of the later Claussen Patent claim in the question is intended to imply, with the false assumption of my assent. It follows, therefore, that the alleged "two differences" named in the question are not all the differences between the combination expressed in claim 2 of the Claussen Patent No. 598497 and the Claussen Exhibit No. 5-6, but that there is specifically a difference in the cam for controlling the movements of the carrier and, underlying this and all other purely structural differences, there is a radical and fundamental difference in both structural and operative conception, as well as of purpose, process and product.

Secondly, the question, as illuminated by counsel's objections to the last answer, proposes to dissociate Claussen Exhibit No. 5-6 from Claussen Exhibit No. 3, whereas, it is only by reference to Claussen Exhibit No. 3 that Claussen Exhibit No. 5-6 is intelligible at all. And by the aid of said Claussen Exhibit No. 3 we are distinctly taught that Claussen Exhibit No. 5-6 represents only the first glimmerings of the V plate idea, incomplete and inoperative even as to that, but without pretense to operativeness or definiteness as to anything else. Even the maturer sketch of the same V plate machine found in Claussen Exhibit No. 3 still shows inoperativeness, and the V plate machine, to which both these Claussen sketches relate, nowhere appears in operative form prior to the drawings of the Claussen V Plate Patent No. 574020, wherein Claussen obviates the difficulties of his sketches by appropriation of the Liddell idea of the patent in suit, avoiding the clashes and interferences of his sketches by dropping out altogether the so-called pivoted carrier and its accompanying cam and mounting his tucker plate on movable trunnion supports. The question is, therefore, unreasonable and unwarranted in its assumption of definiteness and completeness in Claussen Exhibit No. 5-6 made for purposes of comparison with Claim 2 of the Claussen Patent 598497.

Thirdly, there is no such condition in the V plate machine, as in part foreshadowed in Claussen Exhibit Nos. 5-6, as further developed in Claussen Exhibit No. 3 or as finally presented in the Claussen Patent No. 574020, which gives place for any

such question as that asked me in the last paragraph but one of the interrogatory. The V plate feature of the machine forestalls the idea and the need of side clips on the tucker plate. The interrogatory in fact declares, as what it calls the second difference, that the paper is held against the tucker plate in the V plate mechanism of Claussen Exhibit 5-6 "by the joint operation of the turning fingers *b* and the V plate *y*." This requisite to the formation of the peculiar "new-process" bag bottom is, therefore, already present in the machine or sketch, and there is, hence, no occasion to provide such requisite, either by means of side clips on the tucker plate or otherwise, whether by the aid of invention or not. But the question proposes the *substitution* of the "side clips 83" for (that is, in place of) the turning fingers *b* and V plate *y* of sketch. In other words, it proposes to throw out of the sketch its one distinguishing feature—its very motive—its reason for being. And I am asked if to do this, as Claussen is assumed by the question to have done, *as if in pursuit of the purpose of his sketch No. 5-6*, in the Claussen Patent No. 598497, involved invention. My answer is that Claussen did not in his Patent No. 598497 do anything with, or in line with, the machine of Claussen Exhibit No. 5-6, by leaving out of the machine of that patent the V plate mechanism of the sketch, and using side clips on his tucker plate; and I add that the prior art of the Lorenz & Honiss Patent No. 337966, or of any other prior patent or machine showing side clips had nothing to do with prompting him or in justifying him in such abandonment of the V plate idea and mechanism of the exhibit sketches. In said patent 598497 Claussen was not trying to make a new process bag by any mechanism, but was merely appropriating the central idea of the Liddell Patent in suit for the manufacture of the regular Deering bag, and in doing so simply took the pivoted carrier from the different V plate machine sketches, operated it by a different cam, combined it in the Liddell fashion with the tucker plate and made a different machine altogether from that contemplated in Claussen Exhibit No. 5-6 and in Claussen Exhibit No. 3. The specific question asked me has no place there-

fore, in connection with what Claussen actually did in his said Patent No. 598497.

[*Recess.*]

[*Defendant's counsel objects to the whole of the answer, because it contains no statement in the affirmative or in the negative of the single question to which x-Q. 539 was elaborately and expressly confined, and because the answer consists in an elaborate argument, the avowed conclusion of which is that the specific question asked of the witness has no place in connection with what Claussen actually did in his Patent 598,497, which conclusion is equivalent to a decision by the witness that the question put to him is immaterial to the case.*]

[*Hereupon defendant's counsel suggests to the court that the witness, instead of answering x-Q. 539, has assumed to elaborately argue and then to definitively decide that that question is immaterial to the suit.*]

x-Q. 540. During the time you occupied in giving your answer to x-Q. 539, in addition to doing much other business, I went away and called upon the defendant's expert King, and employed him to take a photo-lithographic copy of Claussen Exhibit No. 6 and to carefully ascertain by geometrical calculation the contour that the cam 8 should have, to cause the carrier 6a to move harmoniously with the edge of the tucker plate P, with that carrier extended rearward about 50% of its original length and with side clips 83 of the Claussen Patent No. 598,497 furnished to the tucker plate P of the Claussen Exhibit No. 6. And I employed Mr. King to delineate on that photo-lithographic copy of Claussen Exhibit No. 6, in red ink, the application of such a side clip to the tucker plate P, and also to delineate in red ink such a rearward extension of the carrier 6a, and also to delineate in red ink the exact contour that the cam 8 would require to have, in order to make the carrier 6a work harmoniously with the edge of the tucker plate P, as does the carrier 56 of the Claussen Patent 598,497, with the edge of the tucker plate 75 of that patent. I requested Mr. King to do all

this work with such care as to be able, if necessary, to verify its correctness under oath hereafter. In pursuance of my request, he did, in a short time, all that he was requested to do, and presented me with the result, stating it to be exactly right.

Now I hand to you that photo-lithographic copy of Claussen Exhibit No. 6 thus amended by Mr. King, and I ask you to state whether it appears to you to be substantially what in this question I have stated it purports to be.

A. The merest glance is sufficient to show that it is not correct.

x-Q. 541. Please to state wherein Mr. King's work in red ink on that photo-lithographic copy is incorrect.

A. The error which strikes the eye at the first glance consists in the fact that the red line of the cam outline shows the carrier already started on its inward movement, by the fact that the roller has passed off the outer and concentric portion of the cam nearly half its diameter, while the tucker plate has not commenced its descent or inward movement. There is, of course, nothing in the sketch to show when said tucker plate is intended to begin its descent, further than, as we learn from Claussen Exhibit No. 3, that such descent of the tucker plate is due to begin presently. Obviously, if the cam is to give inward movement to the carrier at the same speed with the inward movement of the edge of the tucker plate, and the carrier begins its descent before the tucker plate starts from its position already considerably above the carrier, it is clear that the tucker plate will never reach the carrier or the paper thereon. The red line cam of Mr. King is, therefore, all wrong to begin with, or as to the very starting point of the concavity.

Second. Not only must the carrier start down or inward substantially at the same moment that the edge of the tucker plate strikes or approximates it, but said carrier must move outward and reach the periphery of the cylinder at the moment the edge of the tucker plate leaves it on its rearward ascent. Assuming the unstarted tucker plate of the sketch to be now ready to start its downward movement, and that its edge will reach the red line prolongation of the carrier before said carrier gets out from under the tucker plate and, say, a sixteenth

of an inch from the extreme rear end of the prolongation of the carrier, it is very easy, by simple measurements, to tell at what point in the revolution of the cylinder said carrier must have moved outward to its periphery, this being the time when a point one-sixteenth of an inch from the end of the prolonged carrier reaches the point which the edge of the tucker plate will simultaneously reach on its backward swing. Therefore, measuring off the width of the tucker plate from its axis to its edge backwardly from said axis to the periphery of the cylinder, tells where the carrier should be coincident with the cylinder periphery. Of course, the cam must have brought it back to this position, and the rear extremity of the concavity of the cam will be located by reference to the then position of the roller belonging to the carrier which rides on the cam. This point will be about three-eighths of an inch farther forward than shown by Mr. King's red line, or in other words, the concavity of the cam will be only about half as long as Mr. King shows it, and will be shorter than shown originally in the sketch, instead of longer, as shown by Mr. King. To a mechanic this lengthy explanation on this point is not necessary, because it is obvious that the length of the concavity cannot be longer than the sweep of the tucker plate edge, but, being nearer the center of the cylinder, must be proportionately shorter. Mr. King has shown it longer whereas it should have been shorter.

The terminals of the concavity, as shown by Mr. King in this sketch, being both out of place, the curvature of the concavity is necessarily erroneous, even assuming such concavity to be shown of the proper depth, which I have here no means of readily and exactly determining. And hence I answer that Mr. King's work in red ink on that photo-lithographic copy is altogether, everywhere and in every particular, erroneous, in so far as the cam is concerned.

x-Q. 542. It is true, is it not, that a proper cam would be concentric with the shaft of the cylinder through at least as many degrees of its outline as Mr. King has shown it to be thus concentric, and which degrees I find by measurement to be about 250?

A. A proper cam for what?

x-Q. 543. I mean a cam proper to cause the elongated carrier 6a, when descending and ascending, to keep out of the way of the edge of the tucker plate P, and also to descend and to ascend harmoniously with that edge, so far as the edge of the tucker plate would need to travel in company with a definite line drawn across the upper surface of the carrier 6a in cooperating with that carrier in the work which the two parts would do, if the carrier were thus prolonged and if the carrier and the tucker plate were thus harmoniously moved? On this point I will further explain that I expected you to answer the question immediately in the affirmative, because it is evident that the cam is composed of a long concentric part of surface and a comparatively short concave part of surface and because you explained in your former answer that Mr. King's red ink line showed that concave part to be too long, and because I logically inferred from that statement that the concentric part was too short, because it must be lengthened a number of degrees, if the concave part is to be shortened a number of degrees.

A. Making proper allowances for the various conditions and factors presented in the sketch, a proper cam for the purpose stated would have a concentric portion in the neighborhood of 300° of a circle.

x-Q. 544. I understand your second criticism of Mr. King's red line cam outline, and I know that criticism to be correct in all respects, unless it is incorrect at one point, which underlies the whole criticism. That point is where you say that "said carrier must move outward and reach the periphery of the cylinder at the moment the edge of the tucker plate leaves it on its rearward ascent." Now it is a fact that Mr. King carefully considered that subject and concluded that the machine might do its work well enough if the tucker plate were to leave the carrier some time before the carrier reached the periphery of the cylinder, and that it was desirable to have the edge of the tucker plate leave the carrier before the carrier reached the periphery of the cylinder, in order to give the carrier more time to get back to that periphery, and thus reduce the steep-

ness of that horn of the cam 8 which is to raise the carrier to the periphery of the cylinder. This explanation shows that the issue between you and Mr. King is confined to the question whether the edge of the tucker plate can leave the surface of the carrier some time before the carrier reaches the periphery of the cylinder, on the one hand, or whether, on the other hand, the carrier must necessarily rise fast enough toward the periphery of the cylinder to keep accurate company with the edge of the tucker plate all the way to that point. Therefore, I ask you what knowledge you have, or what experience you have had, in running paper bag machines, having an oscillating carrier pivoted to a rotating cylinder and working with an oscillating tucker plate, and which knowledge and experience justifies you in positively asserting that in such a machine the carrier must rise all the way to the periphery of the cylinder in company with the edge of the oscillating tucker plate and must not lag behind that edge even during the latter part of its rising to the periphery of the cylinder.

A. My knowledge and experience on that point are of course limited to the Claussen Patent and defendant's machines, including complainant's model of defendant's machine, and the Claussen & Mortson Patent in accordance with which defendant's machine is largely constructed. The Claussen Patent shows diagrams in Figs. 12, 14 and 16 showing several positions of the carrier 56 from the point of its extreme depression in Fig. 12 to its point of extreme elevation in Fig. 16. These diagrams show the carrier as following the tucker plate edge in its ascending rearward movement until the surface of the carrier coincides with the periphery of the remaining portions of the cylinder. Fig. 11 of the Claussen & Mortson Patent, though not showing the tucker plate, shows the carrier and a short cam cavity 47 co-operating with the carrier arm 46, suited to give the prompt outward movement of the carrier necessary to its accompaniment of the edge of the tucker plate in its rearward ascent. Complainant's model of defendant's machine shows the carrier to accompany the rearward ascent of the edge of the tucker-plate, and my recollection of the Walker Model Room Machine is that it corresponds in this respect with com-

plainant's model and with the Figs. 12, 14 and 16 of the Claussen Patent No. 598497.

I may fairly claim to have some additional knowledge on this matter, derived from my examination of other machines concerned in the practical work of making the Deering bag (in the making of which Deering bag, of course, the Claussen Exhibit No. 5-6 gives no information), and from such last mentioned sources of knowledge I am of the opinion that while, desirably, the edge of the tucker plate and the surface of the bed in a machine of the Liddell type (whether constructed according to the details of the Liddell Patent or according to those of the Claussen and Claussen & Mortson Patents) continue in their contacting or proximating relation till the tucker plate leaves the cylinder, nevertheless, such edge and such surface may allowably separate somewhat before. Applying this statement to defendant's machine, I mean that the machine would probably work if such close relation of the tucker plate edge and carrier surface should be made to terminate somewhat before the carrier had reached its extreme outer position, where it is coincident with the rest of the cylinder. The word "substantially" should have been inserted before the words "at the moment" in that part of my previous answer quoted in the present question.

x-Q. 545. Now it appears that your second criticism of Mr. King's red ink outline relates to a matter of degree of admissible departure from a particular geometrical form, and although it also appears from your last answer that it would be admissible to thus depart in the direction which Mr. King took, you seem to think that he departed too far in that direction. I therefore ask you whether it is now your opinion, after all, that the original cam shown in Claussen Exhibit No. 5-6 is nearer right than Mr. King's red ink modification of its outline, because that original cam would carry the carrier 6a back to the periphery of the cylinder with less lag behind the edge of the tucker plate P than would result from Mr. King's red line cam?

A. There is no choice, in my judgment, between two conformations of the cam in the sketch referred to for a purpose

wholly outside of that sketch, and both which conformations are wrong or unsuited, as well as undesigned, for that purpose. As to Mr. King's red line, it is evidently symmetrical as to the concavity and is, consequently, based on the assumption of rise of the carrier to follow the ascending tucker plate edge, as well as of the descent of the carrier to follow the inward movement of said edge, and he simply erred throughout, having fixed his limits for the concavity erroneously to begin with. If he had contemplated coincidence of the carrier surface with the edge of the tucker plate in their descent, and their divergence on their ascent, he would have made a different curve leading from the front end of the concavity to its bottom from that which leads from its bottom to its rear end, which he did not do. Consequently, if the curve back of the middle of the concavity is suited for divergence of the carrier and tucker plate edge, the curve in front of the extreme bottom is unsuited for coincidence of that surface and edge, in addition to the fact that he has not located the front end of the concavity properly for proximity or contact of the carrier and tucker plate at all.

[*Adjourned to Friday, Jan. 15, 1904, at 10:30 A. M.*]

Friday, Jan. 15, 1904, 10:30 A. M.

[*Met pursuant to adjournment.*]

Present—The Notary, and Counsel as before.

[*Defendant's counsel objects to the whole of the answer to x-Q. 545, because it does not state any reply to the question, which was confined to an interrogatory as to which of two cam outlines was nearer right, in the opinion of the witness, and because the answer is confined to saying and arguing that both of them are wrong.*]

x-Q. 546. Day before yesterday, the last thing before adjournment, I put to you x-Q. 539. You appear on the record to have occupied yesterday forenoon in your response to that question, but that response appears to me to be confined to other topics than the single point inquired of in x-Q. 539,

which other topics related largely to the cam 8 of Claussen Exhibit No. 5-6. In x-Q. 540 to 545, inclusive, I followed you in that disgression to the extent of recurring to the subject of the cam 8. Now I do not think it necessary for us to attend to that cam any longer, but I do desire to recur to the question put to you day before yesterday, in x-Q. 539, namely:

"Now I ask you to state whether, in view of the prior art (such as the Lorenz & Honiss Patent 337,966), it involved invention for Edward E. Claussen to add the side clips 83 (as he did in the Claussen Patent 598,497), to the tucker plate P of the Claussen Exhibit No. 5-6, as a substitute for the turning fingers *b* and the V plate *y* of that exhibit."

A. This alleged question, in my judgment, so far lacks coherence as to amount to no question at all. Something more than an interrogation point seems to me necessary to make a question. The interrogatory is like asking whether a man in New York bound for Europe will do more than exercise ordinary judgment in substituting a train for Chicago for the steamship for London. I can't answer the question.

x-Q. 547. Now we have left for consideration, on the subject of Claussen Exhibit No. 5-6 and its comparison with the Claussen Patent 598,497, only one topic, as I understand. That topic is the difference between that exhibit and that patent, which consists in the fact that the oscillating carrier, which is pivoted to the rotating conveyor in both cases, is much longer in the Claussen Patent 598,497, than it is in the Claussen Exhibit 5-6. Now I want to do my part, and I ask you to do your part, towards ascertaining and stating from the record all the concrete facts inhering in that difference. To that end I will ask you some concrete questions, beginning with the following:

About how far must the short carrier 6a of Claussen Exhibit 5-6 be extended to the rear and thus lengthened, in order to make it long enough to be functionally identical with the carrier 56 of the Claussen Patent 598,497; assuming, for the purpose of this question, that the cam 8 is to be given such an outline as will cause the elongated carrier 6a to keep out of the way of the edge of the tucker plate P by avoiding interference therewith, while at the same time coacting with that edge of

that tucker plate substantially as the carrier 56 and the tucker plate 75 are shown as coacting in Figs. 12 and 14 of the Claussen Patent 598,497?

A. Premising that the carrier of the Claussen Exhibit 5-6 is already long enough for the purposes of the sketch, and that, when of its present length, it has no interference with the edge of the tucker plate, I reply that for the different purpose of the Claussen Patent 598,497, and the different mode of co-action of the tucker plate with the carrier set forth in said patent, the carrier of the Claussen Exhibit No. 5-6 would need to be lengthened about 33⅓, or about one-third its present length.

x-Q. 548. I suppose that I have given much more study to Claussen Exhibit No. 5-6 than you have done, and I am certain that I have discovered an error in that drawing, which you have never mentioned, and I believe that that error is self evident to any one who was acquainted with the paper bag machine art in November, 1895, and would be immediately detected by any such man who would give the drawing attention at that time, and would not mislead him at all. But I believe that you, not being a practical paper bag machine man, have always overlooked that error and that that overlooking has led you into an entire series of errors of your own, which series of errors constitute substantially the whole of your criticism upon the Claussen Exhibit No. 5-6 and substantially the whole of your testimony differentiating that exhibit from the Claussen Patent 598,497.

Assuming that you are willing to be corrected, I will explain the subject fully, and will ask you if my explanation is not correct.

I now hand you a photo-lithographic copy of Claussen Exhibit No. 6, unchanged except by the addition of a red line about one-eighth of an inch long under the upper border of the tucker plate P, and which red line indicates the proper location of a side clip 83 like that of the Claussen Patent 598,497 if such a side clip is to be added to that tucker plate, and which red line indicates the location relatively to the tucker plate of that portion of the upper plication of the tucked paper tube which in Figs. 12 and 14 of the Claus-

sen Patent 598,497 is shown as being between the side clip 83 and the tucker plate 75, and which portion of the upper plication of the tucked paper tube is shown in Fig. 14 of the Claussen Patent 574,020, as pressed against the upper border of the tucker plate 102 of that figure and is shown in Fig. 15 of that patent as still pressed against the upper border of that tucker plate, but with the tucker plate turned further back than in Fig. 14. To indicate the exact paper which I have specified by reference to the two Claussen Patents with still more certainty, I am now making two pencil lines on one of the triangular folds of Claussen Exhibit No. 4 and am also making two other pencil lines at the corresponding place of one of the triangular folds of Claussen Exhibit No. 7, and I am marking the triangular areas thus outlined with my initials "A. H. W."

Now having defined in all these ways the exact paper which is to be pressed against the tucker plate P of Claussen Exhibit No. 6 at the location of the red line of which I speak, I proceed as follows with my explanation.

The self evident error in Claussen Exhibit No. 5-6 consists in the fact that its cylinder 6 is shown turned between 20° and 30° more forward than it ought to be when the tucker plate P is in the position shown in Claussen Exhibit No. 6. This error is self evident to any paper bag machine man, because any such man knows that the side clip 20 on the carrier 6a must be exactly opposite the location of the paper, which I have designated by the red line (and which for brevity I will hereafter speak of as the red line location). The side clip 20 must be exactly opposite the red-line location when the edge of the tucker plate P has advanced downward from the position shown in Claussen Exhibit No. 6 until it reaches nearly or quite to contact with the periphery of the cylinder 6. Now inasmuch as the tucker plate P requires time to move from the position shown in Claussen Exhibit No. 6 to that lower position, and inasmuch as the cylinder 6 must be turning in a clockwise direction during that time, and inasmuch as the side clip 20 of the carrier 6a must be opposite to the red-line location at the end of that time; it is certain that the cylinder 6 and the carrier 6a must occupy a position at least 25° in the rear of the position

they do occupy at the time the tucker plate is in the position shown in Claussen Exhibit No. 6. Thereupon the cylinder 6 will start to turn in a clockwise direction, at the same instant that the tucker plate P starts to oscillate downward and forward, and at the instant that the edge of the tucker plate P reaches contact with the periphery of the cylinder or with the surface of the carrier 6a, as the case may be, the side clip 20 will and must be exactly under the red-line location. Now you will see by measurement that the carrier 6a extends rearward from the rear side of its side clip 20 almost exactly 5-16 of an inch, and that the tucker plate P extends backward from the red-line location almost exactly 4-16 of an inch. It follows from these measurements that when the edge of the tucker plate P reaches the line of the periphery of the cylinder 6 it will impinge against the upper surface of the carrier 6a very near to the rear edge of that surface, but still on that surface. It follows from this fact that the carrier 6a must oscillate toward the shaft of the cylinder 6, in order to give room for the tucker plate P to oscillate forward, precisely as the carrier 56 of the Claussen Patent 598,497 must likewise oscillate for the same purpose.

Now the operation of the tucker plate P and the operation of the carrier 6a of Claussen No. 6 is exactly the same, whether the V plate *y* and the turning fingers *b* are employed to make such a bag as Claussen Exhibit No. 4, or whether that V plate and those turning fingers are omitted, and a side clip 83 is added at the red-line location, in order to make such a bag as Claussen Exhibit No. 7, and the V plate *y* and the turning fingers *b* have no relevancy whatever to the conjoint action of the tucker plate P and the oscillating carrier 6a, those two parts having no agency in forming the final flaps of the bag and no agency whatever in doing anything which distinguishes Claussen Exhibit No. 4 from Claussen Exhibit No. 7, which two exhibits, as has been proved in the case and is well known to you, represent the V plate bag and the Deering bag respectively.

It follows from the foregoing explanation that the fact that the carrier 6a of the Claussen Exhibit No. 6 is shorter

than the carrier 56 of the Claussen Patent No. 598,497 has no functional significance whatever. This will be apparent to you and to any one who compares the carrier 6a of Claussen Exhibit No. 6 (as I have explained it) with the carrier 56 in Figs 12 and 14 of the Claussen Patent No. 598,497. That comparison will show that that carrier 56 would be exactly like the carrier 6a, if that carrier 56 had its tail cut off just a little in the rear of the location on that carrier of the edge of the tucker plate 75 in Figs. 12 and 14. And it is also apparent that that carrier 56 might have its tail thus cut off without affecting the function or utility of that carrier in the making of the diamond fold, because the tail thus removed has no function except to carry the creaser groove 109, and because that tail and that creaser groove are not concerned in making the diamond fold, and never do anything until after the diamond fold is completed, when the creaser groove helps to define the line upon which one of the final flaps of the bag bottom is turned over.

Thus I have shown you how your error in overlooking the self-evident error in Claussen Exhibit No. 6 which I have described misled you into your almost totally wrong understanding of that sketch; and I have made this explanation with positiveness, because in November, 1895, and long before that time, I knew as well as I knew my alphabet that in any machine for manufacturing any paper bag having inwardly inclined longitudinal folds and inwardly inclined triangular folds like Claussen Exhibit No. 4 or Claussen Exhibit No. 7 the side clips which do the work of the side clips 20 of Claussen Exhibit No. 6 must be exactly opposite the red-line location on that exhibit, as shown to you, at the time that the parts carrying such side clips 20 below the paper and the red-line location of the upper plication in the tucks begin to be separated from each other in the process of opening out one end of a tucked paper tube from the condition shown in Fig. 6 of the Claussen Patent 598497, to the condition shown in Fig. 16 of the drawings of that patent.

In order that there shall be no doubt in any mind on this point, I illustrate it by calling attention to Figs. 8 and 10 of the Claussen Patent 598,497, in which the proper loca-

tion of the side clip 20 of Claussen Exhibit No. 6 is indicated by the side clip 67 and in which the necessary place of the red-line location is indicated by the side clip 83.

When Mr. Claussen made Claussen Exhibit No. 6 in November, 1895, it is within my personal knowledge that he knew as well as he knew his alphabet that the clip 20 must be opposite the red-line location when the edge of the tucker plate P has oscillated downward far enough to reach the paper. I don't know how he happened to make that error in Claussen Exhibit No. 5, but the error was probably due to the fact that that exhibit is a pencil sketch apparently made for his own memorandum, and to show the essential character of his invention and was made without any attempt to indicate the necessary timing of the revolution of the cylinder 6 with the tucker plate P; the necessity for harmonious timing of those two parts being obvious to everybody acquainted with self-opening square paper bag machinery in November, 1895.

This long question covers comprehensively, as I understand what remains after your preceding answers of the question of the relations between the Claussen Patent 598497 and the Claussen invention as shown in the Claussen Exhibit No. 5-6; and I have ventured to explain that subject, as I understand it, in one long question, rather than to try to elucidate the matter by a series of many shorter questions. But you will understand that I am not undertaking to testify as a witness in the case, but am only putting a long leading question to you in the form of assertions, and now I ask you to reply to that question by pointing out all the respects in which after careful consideration you shall find it to be erroneous, in case you do find any error or errors among the statements of which the question is composed in form.

[*Recess.*]

A. The statement of counsel in the question, like most of his alleged explanations and allegations of fact, submitted in questions for my criticism, contains a grain of truth and a multitude of errors, of fact, inference and conclusion. The

whole argumentative structure erected in the question tumbles to the ground on the slightest touch of plain common sense and proven fact which I will briefly give it.

It *is* a fact that the side clip 20 on the carrier of Claussen Exhibit No. 5-6 should have been shown opposite the added red line in the photo-lithographic copy, handed me in the question, of Claussen Exhibit No. 6 (and which I will call Claussen Exhibit No. 6-7), which short red line represents the position which would be occupied by a side clip on the tucker plate, if such side clip were on the plate. The primary error of counsel is in assuming that, to correct this location of the side clip 20 on the carrier, it is necessary to move the carrier and the cylinder backwardly, so as to bring the clip 20 under the red mark. And he concludes that if this were done, then the rear end of the carrier would be brought just under the edge of the tucker plate P and there would result in the sketch, thus corrected, substantially what is shown in the Claussen Patent No. 598497. Q. E. D.

But this assumption is entirely erroneous. It is not necessary to suppose the cylinder and carrier turned farther back for this purpose. It is only necessary to put the side clip farther back on the carrier—

[*Note by Defendant's Counsel. At this point the witness invited defendant's counsel to insert in the record any suggestion he has to make upon the statement just made by the witness; and thereupon the defendant's counsel suggests that the statement of the witness that "It is only necessary to put the side clip farther back on the carrier" is shown to be erroneous by the following consideration. If the side clip 20 were moved back upon the surface of the carrier to a position under the red line, then its forward edge would be 3/4 of an inch back of the front clip 20, which would make the machine entirely inoperative, because that portion of the paper bag blank forward of the side clip 20 could never reach the front clip 20 at all. The proper proportion of distance between the forward edge of the side clip and the working edge of the tucker plate, on the one hand, and the forward edge of the side clip and the front clip, on the other hand, is shown in many patents in the case,*

including Fig. 12 of the Claussen Patent 598497 to be about as 1 is to 5. But if the side clip 20 were moved back, as suggested by the witness, those two distances would bear to each other the relation of 3 to 6, and no self-opening square paper bags like any of the self-opening square paper bags in this case or illustrated in any of the patents in evidence in this case, can be made on any machine where the distance between the forward side of the side clip and the front clip is twice as great as the distance between the forward side of the side clip and the edge of the tucker plate. This latter fact is well known to every paper bag machine man acquainted with the subject, and it conclusively shows that the self-evident error in Claussen Exhibit No. 6 cannot be remedied by moving the side clip 20 from its present position on the carrier 6a *back to a position on that carrier directly under the red line; and that that self-evident error can be removed only by rotating the whole cylinder* 6 *with its carrier* 6a *back far enough to bring the side clip* 20 *somewhat further back than the red line, with a view to starting the cylinder* 6 *in its clockwise motion from that backward position at the same instant that the tucker-plate P begins to oscillate downward from the position shown in Claussen Exhibit No. 6, so that when the edge of the tucker plate P reaches the periphery of the cylinder or carrier, as the case may be, the side clip* 20 *on the carrier, while retaining its present position on the carrier, will be directly under the red line.*]

The Witness resumes. (I invited defendant's counsel to say on the record what he started to say off the record, believing that, like a horse in a ditch, every additional plunge would carry him further towards the bottom. And I was not mistaken.)—Claussen must be supposed to have ultimately discovered his own error and to have corrected it in the proper way. Turning to Claussen Exhibit No. 3, which defendant's counsel has taken great pains to prove by Claussen himself to represent the same machine that he had partly in mind in preparing Claussen Exhibit No. 5 (see question 309, page 82; question 316, page 85; question 320, page 86; question 325, page 88, and r-d-Q. 408, page 109, D. P. R.) and it will be seen that the side clips of the carrier, one of which

is marked 20, are situated at the rear end of the carrier, instead of in the erroneous, more advanced position given them in the Claussen Exhibit No. 5-6. And, parenthetically, Claussen here also disposes of the disproportion referred to in the above interjected note of counsel, by making the carrier 6a proportionately shorter, and bringing the end clip 19 into somewhat the proper relation to the side clips.

It is, therefore, manifestly *not* a necessary result of locating the side clips 20 in proper relation to the tucker plate, or to the entering bag blank, that the carrier of Claussen Exhibit No. 5-6 shall be bodily set back so as to bring the rear end of that carrier into the path of the edge of the tucker plate. Claussen's conspicuous idea in these sketches 5-6 and 3 was that the tucker plate should *not* strike the carrier. In Claussen Exhibit No. 5-6, whatever that tucker plate would strike, it clearly would not strike the carrier. This is the one thing, additional to the V plate scheme, which Claussen Exhibit No. 5-6 makes absolutely plain. And the persistence of this idea in Claussen's mind is as conclusively shown by the more mature and elaborate drawing Claussen Exhibit No. 3, wherein the tucker plate edge passes down so far to the rear of the carrier as not only to miss the carrier, but also to miss the gap behind the carrier, and to strike upon the cylinder itself with the effect of making the machine inoperative for a single turn. Besides, Mr. Claussen testified, on behalf of defendant, that the tucker plate of this V plate machine of Claussen Exhibit No. 5-6 and Claussen Exhibit No. 3, was not intended to strike upon, or to co-operate with, the carrier as in the Claussen Patent No. 598497, but, affirmatively, was intended to clear the carrier and strike into the space or recess in the cylinder back of the carrier. And, it being apparent from Claussen Exhibit No. 3, that it did not strike into that space or recess, but upon the periphery of the cylinder back of the recess and still further from the carrier, defendant's counsel carefully brought out the fact that the *recess* might be made longer rearward to avoid this clash and thus let the tucker plate in (See r-x-Q. 429, 430 and to 433 inclusive, and r-r-d-Q. 434, 435, 436 and 437, all found on pages 114 to 117, D. P. R.).

As to Claussen Exhibit No. 5-6, there is absolutely nothing to show that there is *any cylinder at all* accompanying the carrier. For all that that sketch shows, the carrier may be mounted between two parallel disks, with a wholly open space between them, except as to the carrier and as to the cam. Read technically, this is the construction which the sketch shows. The shaft which is cut in this view is shown in section, but there is nothing else shown in section, which technically means that there was nothing else in the path of the section plane. That section plane is this side of the carrier, because the carrier is shown in side view, but there is no cylinder shown in side view, nor is there a cylinder shown in section. The reading of the drawing is, therefore, that there is no cylinder present. The cam is exposed, as being between two similar and parallel disks carrying the carrier. The information given by the sketch is therefore that there was no cylinder for the tucker plate to strike against, and equally that the tucker plate was not to strike against the carrier, but was to strike down into a free space back of the carrier.

The foregoing seems to me conclusive in contradiction of the assumption of counsel's question, that the tucker plate will, in any case, either by any correction of errors in the sketches or in pursuit of any purpose indicated in the sketches, even as illuminated by the testimony of Mr. Claussen himself, strike against the carrier; and it is conclusive also that the construction and mode of operation, as between a tucker plate and carrier, set forth in the Claussen Patent No. 598497, was not and could not be derived from Claussen Exhibit No. 5-6.

This much established, it is probably unnecessary to consider any of the other errors of statement contained in the question, although there are several, and they are easily exposed. I content myself with briefly saying that the allegation that "the operation of the tucker plate P and the operation of "the carrier 6a of Claussen Exhibit No. 6 is exactly the same, "whether the V plate *y* and the turning fingers *b* are employed "to make such a bag as Claussen Exhibit No. 4, or whether "that V plate and those turning fingers are omitted, and a "side clip 83 added at the red-line location (in Claussen Ex-

"hibit No. 6-7), in order to make such a bag as Claussen Ex "hibit No. 7," and the inference drawn therefrom by counsel, are shown to be erroneous by Claussen Exhibit No. 3, where the carrier is given no such movements in such opening of the folds of the bag blank in the maner called for in the V plate machine, as is required in making the Deering bag like Claussen Exhibit No. 7.

[*Defendant's counsel offers in evidence the drawing referred to by the witness in the last answer as Claussen Exhibit No. 6-7, and defendant's counsel requests that that drawing be marked "Claussen Exhibit No. 6-7," and be entitled in this case and also in the case of Eastern Paper Bag Company against the Woodward & Rogers Company.*]

[*Adjourned to Saturday, Jan. 16, 1904, at 10:30 A. M.*]

Saturday, Jan. 16, 1904, 10:30 A. M.

[*Met pursuant to adjournment.*]

Present—The Notary, and Counsel as before.

x-Q. 549. Please now to look at Complainant's Exhibit Drawing Walker Model Room Machine and imagine that machine to be changed in the single respect of cutting off the carrier 56, ⅛ of an inch rearward of the straight line which crosses that carrier in Fig. 2 of that drawing adjacent to the designating numeral and letter 82a; and on that assumption state whether that excision and removal of the rear part or tail of that carrier would substantially change the character of the Walker Model Room Machine in respect of its relations to Claussen Exhibit 5-6 or in respect of the earlier art or in respect of the later Liddell Patent in suit, or in any respect whatever. Please to treat this question in detail, unless you are able to answer all parts of it in the negative, in which latter case the word "No" will be a sufficient answer.

A. The proposition of the question is to cut off the free end of the carrier so that the rear edge thereof, then left, will extend only an eighth of an inch back of the edge of the tucker

plate, instead of an inch and a half, say, on the scale of that drawing.

Answering as to the supposed relation of the Walker Model Room Machine to the Claussen Exhibit 5-6, in the first place, the Walker Model Room Machine has no relation to the Claussen Exhibit 5-6 in any vital matter, and such excision and removal would not impart any vital relation to said machine and said sketch. I recognize that Claussen Exhibit 5-6 (as explained in the testimony of Mr. Claussen, and as illuminated by Claussen Exhibit No. 3, in connection with Claussen's testimony), has some hints of details individually resembling somewhat certain details in the Walker Model Room Machine, but in so indefinite and inchoate or protoplasmic, if not chaotic, condition, that, even as individuals, they are unintelligible from said sketch No. 5-6 alone, while Claussen Exhibit No. 3 and the Claussen testimony (representing Exhibit No. 3 as being a more elaborate development of the sketch No. 5-6), show the individual details of said sketch to have been, or to have been intended to be, associated, combined or related in a manner totally different from what is shown in the Walker Model Room Machine; so that I repeat, there is no vital relation whatever between the Walker Model Room Machine, as an organization, and the contents of Claussen Exhibit No. 5-6. And the excision proposed would not establish a relation between them.

As to the relation of the Walker Model Room Machine to the earlier art, it has been made plain that, as to the essence of that machine, the only earlier art is the Liddell Patent in suit, and the answer on this point will be the answer with respect to the Liddell Patent in suit. On this question I state that I now see no reason why the proposed excision and removal of a part of the projection of the carrier extending beyond the edge of the tucker plate, still leaving that tucker plate edge over the carrier, should make any difference in the relation of the Walker Model Room Machine to the Liddell Patent. Finally, I now see no reason why such excision and removal should make any difference with the Walker Model Room Machine in any respect whatever pertaining to the formation of the dia-

mond, although manifestly cutting off a part of the cylinder surface which now belongs to the carrier and which contains the flap-creasing notch, and thus is useful in the subsequent operation of folding the flaps.

x-Q. 550. Am I right in understanding that you mean to answer x-Q. 549 in the negative, as to all of its branches?

A. With the explanation given in my answer, yes, you are right.

x-Q. 551. Please now to look at Complainant's Exhibit Drawing Walker Model Room Machine, and imagine that machine to be changed in the single respect of cutting off the carrier 56, $\frac{3}{8}$ of an inch forward of the straight line which crosses that carrier in Fig. 2 of that drawing adjacent to the designing numeral and letter 82a; and on that assumption state whether that excision and removal of the rear part of the carrier would substantially change the character of the Walker Model Room Machine in respect to its relations to Claussen Exhibit 5-6, or in respect of the art prior to the date of that exhibit, or in respect of the later Liddell Patent 558969 of April 28, 1896. Please to treat this question in detail, unless you are able to answer all parts of it in the affirmative or in the negative, in which case the word "Yes" or the word "No" will be a sufficient answer.

A. This question proposes to cut off so much of the free end of the carrier that it will not reach under the tucker plate, but will fall $\frac{3}{8}$ of an inch short of the tucker plate edge, on the scale of this drawing. I answer as in my answer to the last question, with respect to the Claussen Exhibit 5-6, additionally pointing out that the machine we are told said sketch belonged to does not, and did not, have its essence solely in the shortness of the carrier, or in other words, in its failure to reach the tucker plate. The proposed mutilation of the Walker Model Room Machine would, therefore, only give another detail of visual resemblance between the Walker Model Room Machine and the Claussen Sketch 5-6, without establishing any correspondence in essential character. The cutting off of the carrier of the Walker Model Room Machine, as proposed in the question, does not transform that machine into a

V-plate or new process bag machine (for which we are told the sketch was designed), and especially does not carry the Walker Model Room Machine back to the inchoate state of unsolved questions existing in the sketch, even as to the different kind of machine and the different mode of operation and the different sort of combination which we are later told by Mr. Claussen he was feeling after in said sketch. And this is no more true or obvious than that the mere existence, in the sketch, of a carrier or pivoted segment of a cylinder which does not reach the tucker plate or co-operate therewith, does not imply the disuse of the V-plate devices (shown in that sketch as part of the new process bag scheme), and the substitution therefor of tucker plate fingers and other features suitable for making a Deering bag.

As to the remaining branches of the inquiry (which appear to me to form only a single inquiry, namely, as to the relations of the mutilated machine proposed to the Liddell Patent in suit), in this inquiry there seems to me to be, first, a question of practical operativeness, and, second, a question of law. If the machine will still be practically operative, it will be so operative because it still retains what it had before and had derived from the Liddell Patent in suit, with respect to the forming plate or tucker plate provided with fingers for handling the upper ply of the old style Deering bag, in combination with the continuously advancing or rotating bed and with mechanism for operating these parts in unison, and the equivalent of what Liddell shows and describes in the patent in suit for advancing the edge of the tucker plate coincidently with the adjacent surface of the cylinder in the formation of the diamond, said cylinder or bed being provided with side clips, or with side clips and a front clip, for seizing the lower ply of the tucked paper tube.

Assuming operativeness, the question of law is whether the Liddell Patent claims in suit are evaded by shortening the carrier as supposed, while preserving the same inward and outward movement of the carrier that has been given it to co-operate with the tucker plate when unshortened as supposed. This is a question outside my sphere, and, moreover, is one

which does not arise in the consideration of the actual construction of the Walker Model Room Machine. I may properly say, however, that I do not understand actual contact of the tucker-plate edge with the cylinder to be necessary to conformity with the claims, any more than it is necessary to actual operativeness of the Liddell Machine or of defendant's Walker Model Room Machine. Indeed, the edge can never actually come in contact with the cylinder, because the bag blank is interposed between them; and it is sufficient in practice if the edge of the tucker plate proximates the surface of the cylinder or bed without actual and forcible pressure of the bag blank against the cylinder surface. The important thing seems to be that the edge of the tucker plate preserves a substantially permanent relation to a particular transverse line on the surface of the cylinder or bed in the diamond forming operation, which is only another way of saying that it shall act on a line of the blank at a certain distance from the points where the blank is grasped and held by the side clips, so that the line of fold made over the edge of the tucker plate shall be in the right place with respect to these holding and folding points. I may further add that the legal question involved may be simplified by considering the proposed shortening of the carrier as practically the same thing as cutting a wide notch in the carrier under the edge of the tucker plate, extending from a point $\frac{3}{32}$ of an inch in front of said edge to an equal or any convenient distance back of said edge, so that opposite the said edge of the tucker plate the blank is unsupported.

With my present light, I am unable to express an opinion in answer to the question, either as to operativeness of the Walker Model Room Machine having its carrier shortened as proposed in the question, or as to the effect of such change with respect to the Liddell Patent in suit, from a legal standpoint.

[*Recess.*]

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x-Q. 552. Your long answer to x-Q. 551, after being carefully studied by me, appears to me to be out of conformity to that question, although it refers in part to the same subject, and

A. I beg to remind counsel that I am quite competent to judge in how many ways a question may be answered, and to determine how I will answer it.

Answering, I am unable to say whether or not the Walker Model Room Machine would be inoperative when mutilated as proposed in the question.

x-Q. 554. Now please to assume that the Walker Model Room Machine, when mutilated as stated in x-Q. 553, would be operative to do the same work that it does without the removal of the specified part of the carrier 56; and on that assumption please to state whether that machine would then be in conformity to Claim 1 or to Claim 2 or to Claim 7 of the Liddell Patent 558969; and on this point I call your attention to the fact that each of those claims specifies that the Plate E is to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder.

A. In answer to this question I refer to the third paragraph of my answer to x-Q. 551, which paragraph begins with the words "Assuming operativeness." I intended in that paragraph to indicate, as I now express, my inclination to the opinion that the Walker Model Room Machine, with its carrier shortened so as to fail of reaching the edge of the tucker plate, would, nevertheless, if practically operative, substantially comply with the claims 1, 2 and 7, in suit, of the Liddell Patent No. 558969.

x-Q. 555. Please now to look at Complainant's Exhibit Drawing Walker Model Room Machine and imagine that machine to be changed in the single respect of unscrewing and removing the two screws which hold the piece 82 in place and the resulting removal of that piece from the machine; while leaving the carrier 56 exactly as it appears in the drawing and also leaving the two side springs 500 exactly where they appear in the drawing and leaving the machine absolutely unchanged in every respect except in the removal therefrom of the piece 82; and on that assumption please to state whether the machine would still be operative to do the same work that it does now with the piece 82 present thereon. In this case, also, please to state your conclusion without stating any reason for that conclusion, until such a reason is asked for.

much as the boundaries of the City of New York are out of conformity to the County of New York, though the territory of the two jurisdictions is in part the same. Now because I think x-Q. 551 to be very important, and because I think you have made no headway toward answering it with any accuracy, I find it to be my duty to divide the subject up into shorter questions of particular precision, and therefore I begin as follows:

Please to look at Complainant's Exhibit Drawing Walker Model Room Machine and imagine that machine to be changed in the single respect of cutting off the carrier 56 ⅛ of an inch forward of the straight line which crosses that carrier, in Fig. 2 of that drawing, adjacent to the designating numeral and letter 82a; and on that assumption state whether that excision and removal of the rear part of the carrier would substantially change the character of the Walker Model Room Machine in respect of its relation to Claussen Exhibit 5-6, though not being enough to make the Walker Model Room Machine conform in all respects to Claussen Exhibit 5-6?

A. In my opinion it would not, materially, by which I mean with respect to anything material to the distinctive idea said or seen to underlie the sketch Claussen Exhibit No. 5-6 referred to. It would merely produce similarity in a detail.

x-Q. 553. Please to look at Complainant's Exhibit Drawing Walker Model Room Machine and imagine that machine to be changed in the single respect of cuttting off the carrier 56, ⅛ of an inch forward of the straight line that crosses that carrier in Fig. 2 of that drawing adjacent to the designating numeral and letter 82a; and on that assumption state whether that excision and removal of the rear part of the carrier would make that machine inoperative. This question admits of only one of three possible answers, namely, an answer in the affirmative or an answer in the negative, or a statement that you do not at present know the truth on the point inquired of. Please to give one or the other of those answers and please do not, until so requested, state the mental processes or arguments which may pass through your mind when you are deciding how to answer the question.

A. I don't know, but I think not.

x-Q. 556. Now, please to assume that the machine would be operative to do the same work that it does now, even if that piece 82 were removed therefrom without any other change being made therein; and on that assumption please to state whether that machine would then be in conformity to Claim 1 or to Claim 2 or to Claim 7 of the Liddell Patent 558,969?

A. As I cannot now conceive that the machine with the T-shaped piece 82 removed would operate at all, or, that, if it would operate at all, it would operate in the same way as the tucker-plate or "forming-plate" of the Liddell Patent in suit, I cannot see that it would conform to Claims 1, 2 and 7 of that patent.

x-Q. 557. I call your attention to the fact that x-Q. 556 was based on the assumption of the operativeness of the machine, and I ask you to assume that operativeness, and on that assumption then to answer x-Q. 556.

A. I repeat that I cannot conceive that it would operate in the same way in that case, as the forming-plate of the Liddell Patent in suit, or the corresponding plate 82-560 of the Walker Model Room Machine, operates, and therefore do not see that it would conform to Claims 1, 2 and 7 of the Liddell Patent in suit.

x-Q. 558. Your answer is not responsive to the question, because it may not be necessary to the conformity inquired of that the machine should operate in the same way with the piece 82 absent as with the piece 82 present, and your answer is also irresponsive, because instead of giving any definite information upon the subject inquired of, you simply say that for certain reasons (which are plainly inconclusive one way or the other) you cannot see that the altered machine would conform to Claims 1, 2 and 7 of the Liddell Patent 558,969. Now, Mr. Dayton, x-Q. 556 is very simple and very plain, and I am entitled to a direct answer thereto, and I must ask you to either answer that question in the affirmative or to answer that question in the negative, or to say that you have not yet given the point sufficient consideration to answer it at all.

A. I would rather say that my present opinion, formed on

the spot, is that the machine, with the single change referred to, would not conform to Claim 1, 2 or 7 of the Liddell Patent in suit.

x-Q. 559. Now please to state your reason or reasons for that opinion.

A. My reason for that opinion is that the portion of the forming-plate which carries the creasing or defining edge, to wit, the piece 82, and which now, in conformity with the claims, oscillates about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder, will be absent in the supposed case.

[*Adjourned to Monday, Jan. 18, 1904, at 10:30 A. M.*]

Monday, Jan. 18, 1904, 10:30 A. M.

[*Met pursuant to adjournment.*]

Present—The Notary, and Counsel as before.

x-Q. 560. The record in this case shows that this is the fourth deposition you have given in this case, and that the direct-examinations of those four depositions have occupied more than thirty days during the nearly two years which have passed since you began the first of those depositions, and that the cross-examinations have occupied about half as much time as the direct-examinations. Now I inquire whether you have been coached at all by Mr. Betts or Mr. Chambers, or any other lawyer or expert employed on behalf of the complainant, in respect of the answers which you have made to any of the questions put to you in those four depositions, or in respect of any of the topics upon which you have made statements in those four depositions or any of them.

A. I have not.

x-Q. 561. It is true, is it not, that in respect of the third and fourth of those depositions (which appear to have occupied nearly all your time during the last two months or more) the following statement is substantially correct?

Those depositions have been taken down in typewriting as the questions were put and the answers were made successively,

and the typewriter operator has made one ribbon copy and three carbon copies of the depositions as she went along; and that ribbon copy has been treated by the notary as the original deposition, to be certified by him, and one of the carbon copies has been purchased by me from the notary, and another carbon copy has been delivered to Mr. S. R. Betts from hour to hour or from day to day, and the other carbon copy has been sent at the close of each day's work to Mr. Francis T. Chambers, the Philadelphia counsel of the complainant.

A. So far as I know the facts, that is substantially correct, and is in accordance with my understanding.

x-Q. 562. It is true, is it not, that during the two months or more you have been engaged nearly all the time on the third and fourth of these depositions you have been in frequent conversation with Mr. Betts, relevant to the case, and that those conversations have occurred when he and you were in conference in his private office, with no one else present, and sometimes when Mr. Chambers was present, and sometimes when other persons were present, and sometimes when Mr. Betts and yourslf were lunching together in the Lawyers' Club in this building.

A. That is not true. My conversations with Mr. Betts, or with others, concerning the case, have been very few and infrequent. And generally they have not related to the subject matter of the issue or of the testimony, but more commonly have related to the proceedings which have occurred in his absences from the room, to questions of adjournment, prospect of conclusion of the cross-examination, progress of the work of correction for the printer, desirability of the reading of the final proof by me, and matters of simalar sort; and sometimes —perhaps twice—involved conjectures as to the drift or the propriety of the cross-examination, but never involved either inquiry as to my attitude on probable questions or instruction or intimation as to answers on any point. It is now a long time since I have seen Mr. Chambers here or elsewhere, but when he was twice here, I think, in the first six weeks of the deposition, there was nothing said between him and me, or by him or Mr. Betts in my presence, that any one could complain

of, as in any wise bearing upon testimony I should give, or upon the testimony I had already given. Indeed, I have now a very vague recollection of the subjects of conversation on those occasions, but I am sure I should have remembered accurately, if anything in the nature of instruction or suggestion had occurred. I have rather frequently been invited to luncheon by Mr. Betts and have accompanied him to luncheon at the Lawyers' Club several times, and at one time did so almost daily. On these occasions the case in hand was rarely mentioned and, when mentioned, the references to it were brief and insignificant. There has been absolutely nothing in the nature of consultation pertaining to the case during the cross-examination, and nothing at any time that was not fully set forth in the opening part of the cross-examination.

x-Q. 563. Have you received any suggestions from Mr. Chambers relevant to the deposition at any time since the present deposition began on Nov. 12, 1903? I mean to inquire whether any suggestions came from him to you in writing or through Mr. Betts, for you have already covered the ground in respect of conversation with Mr. Chambers personally.

A. I do not recall any. Such direct communications as I have had with Mr. Chambers have related, so far as I recall, to the policy of continuing to stay by the case until the cross-examination should be completed, I having written to both counsel for complainant at different times relative to adjournments which I desired, in order to attend to other matters which were exceedingly pressing by reason of the unexpected length of time taken up by this matter.

x-Q. 564. Your testimony this morning corroborates an opinion which has been forming itself in my own mind for a good while, and to make the matter perfectly complete I inquire whether I am not right in understanding that you are the only person on the side of the complainant who understands the complainant's case thoroughly; and that the entire management of the complainant's contentions has been committed to you; at least in respect of questions of similarity and difference between the patent in suit and the defendant's machines and in respect of similarities and differences between the patent in

suit and the nineteen prior patents for doing the same work and in respect of similarities and differences between the patent in suit and the original Liddell drawing in the Hunter file; and in respect of similarities and differences between the defendant's machines and the Claussen Patent 598497 and the Claussen Exhibits Nos. 5-6 and No. 3, respectively.

A. You are very far from right, I think, in respect of all branches of the question. My consultations with counsel before being called to the stand in rebuttal were very thorough and exhaustive, and, following my study of the defendant's record, were marked by very little difference of original opinion on any point covered by the question. I acquired from such consultations such advantage as I could have acquired only from men thoroughly acquainted with the case and, though believing that I contributed in such consultation somewhat to the final conclusions to which we were all led, I think that fact in no wise shows lack of study or of judgment on the part of counsel. I have had absolutely nothing to do with the management of complainant's contentions further than to express my own opinions, with which I have understood complainant's counsel to be in accord, so far as they were canvassed in the consultations referred to. There have, of course, arisen questions in the cross-examination which had not been specifically anticipated, and therefore had not been discussed, and I am not now advised whether or not the opinions I have given in such cases meet the approval of defendant's counsel. But outside these I think complainant's counsel and I were in full and substantial accord before my deposition began. And on this point I will add that prior to my two depositions in rebuttal, and prior to the consultation which preceded said depositions, I was called upon to prepare in writing a statement of my views on all or nearly all the points covered in the present question for consideration by counsel, and I did so.

x-Q. 565. About what was the date and time of that opinion in writing?

A. In the latter part of October, and the first part of November, 1903, I should say.

x-Q. 566. Did that opinion in writing take into account the

whole of the evidence for the defendant, including the 835 printed pages of testimony and other evidence which had been taken on behalf of the defendant prior to June, 1903, and including the models, drawings, and other exhibits which had been put in evidence by the defendant, in connection with the evidence in those 835 pages?

A. That opinion was prepared with the defendant's exhibit drawings and defendant's printed record before me and after a preliminary examination of them, during which I made notes as my examination proceeded. The opinion was, in fact, a part of my final study of defendant's record and paper exhibits. I did not have before me any of defendant's models, but gathered their import from the testimony concerning them taken in connection with the drawing exhibits.

x-Q. 567. It appears in defendant's printed record taken prior to June, 1903, that the last deposition in that record was finished on May 8, 1903, and it is a fact that I delivered four or five complete printed copies of that record to complainant's counsel, Mr. Betts, within a few weeks after May 8, 1903; but I inquire of you when it was that one of those printed copies was delivered to you by complainant's counsel, together with copies of the drawings mentioned therein, and put in evidence by the defendant in connection therewith, and which drawings are about thirty in number?

A. They were sent me by express possibly as early as in May, but of the precise date I am unable to speak.

x-Q. 568. Now it is true, is it not, that between the time when you received those copies of the defendant's evidence and November 6, 1903, when you began giving your third deposition in this case (namely, the first part of your rebuttal) you did substantially create the complainant's reply to the defendant's evidence, and that you created that reply yourself, without any assistance from anybody, and first embodied it in a written statement which you delivered to complainant's counsel, and afterward re-embodied it in the third and fourth of your depositions in this case, and did all of this intellectual work without any assistance from anybody, except so far as Mr. Lorenz furnished you with ma-

terials to be organized and incorporated with other materials by you in one comprehensive presentation of the complainant's reply to the defendant's evidence?

A. It seems to me that I have merely testified in my two rebuttal depositions to the conclusions reached by me from a study of defendant's evidence and from consultation with complainant's counsel. If this is to be called complainant's reply to defendant's evidence, I should say that such reply created itself, and that I have merely put it into words in answer to the questions asked me. I say "created itself," because it seemed to follow from a study of defendant's evidence, in connection with the patent in suit, and not an artificial product at any one's hands. I certainly had no assistance, other than defendant's evidence, in reaching my conclusions to the extent that I first embodied them in the brief written statement which I delivered to complainant's counsel and which has been only enlarged by my consultation with complainant's counsel and as my testimony proceeded. I have certainly had no assistance from anybody in giving the rebuttal deposition, further than that afforded by the drawings made from time to time by Mr. Lorenz and brought into my testimony.

x-Q. 569. The defendant's evidence includes nine or ten depositions and more than twenty paper bag machine patents and more than twenty drawings and much other matter. Your two depositions in reply or rebuttal make a mass of matter about equal in volume to a volume of reports of the Supreme Court of the United States, and those depositions consist mainly of very long discourses by yourself, each of which contains many thousands of words, and was evidently thought out with great care and was delivered to the typewriter with great deliberation. Now I do not inquire whether you think your third and fourth depositions were deduced logically or were fallaciously deduced from the materials with which they were dealing; but I do inquire whether the work of deducing or otherwise producing that great mass of matter was your work, on the one hand, or whether, on the other hand, it was a symposium which resulted from your contributions and the contributions of Mr. Betts, Mr. Chambers, Mr. Lorenz, Mr. Ward, or

some of them, with or without contributions coming from still other men.

A. My depositions are, in that sense, my work exclusively. I regret that they have been so long, but, from counsel's own statement in the opening of the question, it is apparent that I had a great deal to talk about.

x-Q. 570. Now I want to ascertain, at least approximately, the stages of the very extensive mental labor which you must have undergone, in preparing to give your two rebuttal depositions; and to that end I inquire of you when it was that you first saw and read the Liddell Patent No. 558,969 of April 28, 1896, or any copy of that patent.

A. In the latter half of the year 1901, and I should say in August, September or October of that year, speaking approximately.

x-Q. 571. Am I right in understanding that on that occasion you received a copy of that patent from Betts, Betts, Sheffield & Betts, and received also a copy of the Claussen & Mortson Patent 635090 of October 17, 1899, and a request to examine the two patents and furnish to Betts, Betts, Sheffield & Betts an opinion upon the question whether a machine built like the drawings of the Claussen & Mortson Patent would infringe one or more of the claims of the Liddell Patent 558969; and that in pursuance of that request you informed those gentlemen that in your judgment such a Claussen & Mortson machine would infringe Claims 1, 2 and 7 of that Liddell Patent; and that in pursuance of that opinion of yours this suit was brought in October, 1901, upon the theory that the defendant was making and using, or was about to make and use paper bag machines like the Claussen & Mortson Patent?

A. I received on that occasion a copy of the Claussen & Mortson Patent, along with a copy of the Liddell Patent now in suit and twenty-five or more other patents belonging to the art prior to the Liddell Patent now in suit, and I received these patents under the impression (though without positive information to that effect) that they were, or included, patents set up in an answer in a suit already brought. The Claussen & Mortson Patent sent me was marked to indicate certain modifi-

cations or omissions found in the defendant's machine, and I was requested to examine said Claussen & Mortson Patent, as marked and explained, and to compare it with certain specified claims of the Liddell Patent 558,969, and then to give my opinion as to whether a machine built as indicated in the Claussen & Mortson Patent would infringe said indicated claim of the Liddell Patent. I furnished to Messrs. Betts, Betts, Sheffield & Betts an opinion, in response to this request, designating Claims 1, 2 and 7 as in my judgment, undoubtedly infringed by such a machine. I do not know whether this suit was brought before or after the receipt of such opinion by Betts, Betts, Sheffield & Betts, having never inquired.

[*Recess.*]

x-Q. 572. Please to state the date of the opinion you furnished to Betts, Betts, Sheffield & Betts as stated in your last answer, and state whether that opinion was in writing.

A. I find that this matter was testified about in the opening case of the Eastern Paper Bag Company vs. the Woodward & Rogers Company, and that counsel for complainant ascertained and stated on the record that the said report was dated Jan. 23, 1902, and counsel for the defendant there accepted said date as matter of stipulation. That date is not at variance with my own recollection. Said report was in writing, and if my books were accessible I could give the exact date when it was rendered.

x-Q. 573. Now I want to ascertain all the material facts that were before you when you made that report of January, 1902, and to that end I inquire whether at that time you had any knowledge or information of the facts back of the application for the Liddell Patent in suit, as those facts were afterward stated by Mr. Liddell himself in his deposition in this case.

A. I had before me only the Liddell Patent, Claussen & Mortson Patent and the twenty-five or more other patents referred to above by me, together with the letter of Betts, Betts,

Sheffield & Betts, which letter said nothing about anything in the history of the Liddell invention prior to the date of the patent.

x-Q. 574. Did that letter give you any information about the history of the defendant's paper bag machine, or about the history of the Claussen & Mortson Patent prior to the date of the Claussen & Mortson Patent?

A. It did not.

x-Q. 575. The defendant's paper bag machine, as represented to you by the Claussen & Mortson Patent (amended in some respects for the purpose of showing you the supposed character of the defendant's machine) was different, in some respects, was it not, from what the Walker Model Room Machine afterwards showed the defendant's machines to be, so that the hypothetical defendant's machine, upon which your opinion of January, 1902, was based, did not accurately conform to what the evidence afterwards proved the defendant's machines to be?

A. It was different in some minor respects, but not in essential particulars, as concerned with Claims 1, 2 and 7 of the Liddell Patent in suit, in my opinion.

x-Q. 576. Now it is apparent that your opinion of January, 1902, in order to have any value, required to be based upon an adequate knowledge of the art of self-opening square paper bag machines, as that art existed in patents issued prior to 1896, and therefore I ask you to give a list of whatever such paper bag machine patents were examined and known by you at the time you formed and formulated and rendered your written opinion of January, 1902.

A. I can now only say that it comprised all, I believe, of defendant's patent exhibits, nineteen in number, showing machines for making the diamond fold in the manufacture of self-opening square bottom bags, together with some patents not included among defendant's exhibits, and not including all, I believe, of those patents produced by defendant showing machines for use in the manufacture of other kinds of bags.

x-Q. 577. How certain or uncertain are you, as the case may be, that all of the nineteen prior self-opening square paper bag machine patents, which were afterward introduced in evi-

dence by defendant, were studied by you when you were forming and formulating your opinion of January, 1902?

A. I am pretty certain that was the fact. I do not recall the discovery of anything new to me in that line of patents when presented with the list offered in evidence by defendant. Come to look at that list, I am now inclined to believe that the Kelliher Patent No. 49843, the Appel Patent 387573, and perhaps one or two others that it includes were not included among the patents furnished me by complainant's counsel with the request for that opinion of January, 1902.

[*Defendant's counsel calls the attention of complainant's counsel to the deposition of Mr. Claussen, wherein complainant's counsel required defendant's counsel to produce the written opinion upon which the defendant's business was instituted, and that that opinion was thereupon produced by defendant's counsel and put in evidence by complainant's counsel, as appears on pages 95 and 96 of the defendant's record. Reciprocally, the defendant's counsel now calls upon the complainant's counsel to produce the written opinion of January, 1902, of the witness Dayton, upon which written opinion it now seems to appear that the complainant's case has been prosecuted during the last two years.*]

[*Complainant's counsel does not see in the above statement of defendant's counsel any ground set forth upon which the witness could be required to produce that opinion referred to, even if in possession of the witness, which it is not. The fact that Mr. Walker, under other circumstances, did produce a certain opinion in connection with the deposition of Claussen has no bearing whatever upon this present matter. This suit was not brought in view of the opinion of Mr. Dayton now called for, in fact, was brought long before any such document was in existence. Nor is this case being prosecuted upon said written opinion of the witness Dayton, whatever may be the meaning of that expression in the request of defendant's counsel. But this case is being prosecuted upon the Liddell Patent in view of a proved structure of the defendant's and in view of the state of the art, the general principles of law, and especially the record in this case, as made and to be sometime con-*

cluded. Though complainant's counsel knows of no reason why so much of this Dayton document or letter referred to as relates to the Liddell Patent and to defendant's infringement thereof should not be produced, and yet as apparently it would only gratify the curiosity of defendant's counsel, complainant's counsel must politely decline to produce the document.]

[*Defendant's counsel states, that in his judgment, the complainant's case has no substantial foundation, other than the opinions and arguments which the present witness has inserted in his testimony; and that the correctness or otherwise of those opinions and arguments may be partly investigated by ascertaining whether he has always held the same views, and that, therefore, his written opinion of January, 1902, ought to be produced, and if produced would be admissible in evidence, either to corrobrate or to contradict, as the case may be, those opinions and arguments which the witness has now set forth in his depositions.*]

[*For these reasons the defendant's counsel asks the court to consider and weigh the refusal of complainant's counsel to produce the written opinion of January, 1902.*]

x-Q. 578. Was the Claussen Patent 598497 known to you when you produced and furnished your opinion of January, 1902?

A. The Claussen Patent is a later patent than the Liddell Patent and did not enter into the inquiry. I think it was not submitted to me with the Liddell Patent and the Claussen & Mortson Patent, and, if not, was not known to me at that time.

x-Q. 579. Did you at that time have any knowledge or information of Claussen's work in producing or trying to produce paper bag machinery during the six months last preceding the issuance of the Liddell Patent 558969 of April 28, 1896?

A. Not as distinct from what was shown in the Claussen & Mortson Patent, and of course nothing at all concerning his private work not set forth in patents submitted.

x-Q. 580. It now appears, in the deposition of Mr. Claussen himself, that he contrived what is shown in Claussen Exhibit

5-6 in November, 1895; and that he made the sketch Claussen Exhibit No. 5 on Nov. 6, 1895, and it also appears that he made the drawing Claussen Exhibit No. 3, in November and December, 1895, and January, 1896, and it appears that he explained that sketch and that drawing to Mr. Des Jardins about the time that he made them. Now I ask you whether you ever knew anything, or was informed anything about that sketch or that drawing until you learned it from Mr. Claussen's deposition, which he gave in this case about six months after you gave your first deposition in this case?

A. I did not.

x-Q. 581. When did you first learn that Mr. Liddell had said or had testified that he did not himself invent that corelating mechanism of the Liddell Patent 558,969, which is designated in Claims 1, 2 and 7 of that patent as "operating means for the forming-plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder" and which corelating mechanism includes the cam K, and rod *k*, the link k^2 and the arm connecting that link with the gear M', and when did you learn that Mr. Liddell had said or testified that what he had produced, instead of that corelating mechanism, was the mechanism, shown in the Liddell Drawing No. 1?

A. The first information I had concerning Mr. Liddell's repudiation of his own patent was from a copy of his affidavit, obtained from him by Mr. Walker, which copy was sent to me at Washington shortly after it was made known to complainant's counsel, I believe. That copy was accompanied by a sketch of the eccentric gear mechanism referred to in the affidavit. I heard nothing more about that matter until I read the printed testimony of defendant, including the deposition of Mr. Liddell.

x-Q. 582. I now call your attention to Complainant's Exhibit Operative Model from Liddell Drawing No. 1, and I ask you to state whether you know of any other model having been made by or for the complainant to represent the mechanism of Liddell Drawing No. 1, or to represent the corresponding mechanism of the corresponding eccentric gear apparatus

shown in the blue print of the original Liddell Drawing in the Hunter file?

A. I do not.

x-Q. 583. I now ask you to compare that original Liddell Drawing, as found in the Hunter file, with the Liddell Drawing No. 1, and to state whether they do not substantially agree in all respects, except that the Liddell Drawing No. 1 is more developed, in that it shows the cam K′ for oscillating the arms F′ and F, whereas the original Liddell Drawing in the Hunter file, while it implies that the arm F is to be oscillated, does not show any arm F′, or any cam K′, to raise the arm F, though it does show a spring F′ to lower the arm F, after it has been raised?

A. The Liddell Drawing No. 1 may be said to be more complete than the original drawing of Fig. 1 in the Hunter file, with respect to the presence of the cam K′ and cam arm F′, referred to in the question, but less complete with respect to the eccentricity of the eccentric gears.

x-Q. 584. Now it appears in evidence that Liddell Drawing No. 1 was made under his direction from memory in 1903, to represent his original scheme, as he presented that scheme to Mr. Drury, the draughtsman of Mr. Hunter, in the latter part of 1895, and it appears that the original drawing of Fig. No. 1 in the Hunter file is a blue print, which was made near the end of the year 1895 by Mr. Drury from the drawing which he had made to represent Mr. Liddell's scheme as Mr. Drury understood that scheme at that time. Now I inquire of you whether the discovery and production of that old blue print after Mr. Liddell produced Liddell Drawing No. 1 does not in your judgment substantially corroborate the substantial correctness of Liddell Drawing No. 1, as representative of Mr. Liddell's original scheme of 1895?

A. It seems to me to at least show that Liddell had in 1895 the so-called scheme generally represented in Liddell Drawing No. 1 and that he showed this to the draughtsman Drury, who embodied it in part or imperfectly in Fig. 1 of the original drawing in the Hunter file.

x-Q. 585. Now I call your attention to that original draw-

ing in the Hunter file, and also to Liddell Drawing No. 1, and ask you whether they are not substantially alike in showing the forming-plate E in a starting position substantially tangential to the cylinder C?

A. They are, the free edge of the forming-plate being, however, sufficiently elevated from the cylinder to admit the bag blank beneath it in the original drawing, and therefore rather parallel to a tangent to the cylinder than tangential to that cylinder, while in Liddell Drawing No. 1 the forming-plate is not so lifted at its free edge, and is itself more directly tangential to the cylinder.

x-Q. 586. It is true, is it not, that the original Liddell Drawing shows the forming-plate E in a proper position to receive the tucked paper tube below it, while Liddell Drawing No. 1 shows the forming-plate E in the position it should occupy after it has received the tucked paper tube below it and when it is just starting to co-operate with the cylinder in opening out the forward end of the tucked paper tube; so that both drawings show the forming-plate E in proper position, but Liddell Drawing No. 1 shows a position slightly more advanced than the original Liddell Drawing.

A. I think the statement of the question, while true of the original Liddell Drawing of the Hunter file, is not true of the Liddell Drawing No. 1. My reason for this conclusion as to the latter is, that, while the cam K′ therein shown is widely different from what an operative cam would be, and can be treated only as merely representative, it does show that Liddell did not intend thereby to indicate a down movement from a former stationary receiving position of the forming-plate, and that he committed an oversight in placing the edge of the forming-plate so close to the cylinder as he there shows it. Of course, this is largely a matter of conjecture, and not of absolute certainty.

x-Q. 587. It is true, is it not, that the original Liddell Drawing of the Hunter file and Liddell Drawing No. 1 agree in showing that the forming-plate E is to be nearly, or quite, tangential to the cylinder C when the two parts are to begin to operate together to open out the forward end of a tucked paper

tube into a diamond form; and that both those drawings agree also with the drawings and specification of the Liddell Patent 558969, in that respect.

A. Both the original drawing of the Hunter file and Liddell Drawing No. 1 may be understood to indicate an intention to give the forming-plate, in its receiving position, an attitude approximate to tangential to the cylinder, and the Liddell patent drawings of the patent in suit show the same thing, Fig. 3 of the patent being perhaps the most conclusive and satisfactory on this point.

x-Q. 588. It is true, is it not, that the original Liddell Drawing in the Hunter file and Fig. 3 of the Liddell patent substantially agree in respect of the relative positions of the forming-plate E and the cylinder C?

A. They do.

x-Q. 589. It is also true, is it not, that Liddell Drawing No. 1 shows the forming-plate E somewhere midway in position relative to the cylinder C, as between the position of that forming-plate in Fig. 3 and the position of that forming-plate of Fig. 4 in the Liddell Patent 558969, though somewhat nearer to the position shown in Fig. 4 than to that shown in Fig. 3?

A. That is true.

x-Q. 590. Now please to look at Complainant's Exhibit Operative Model from Liddell Drawing No. 1 and state whether, when the iron pointer (which represents the forming-plate E in that model) first assumes its position of coincidence with the periphery of the large gear (which in that model represents the cylinder C) that pointer is not more nearly radial than tangential to the cylinder C, and indeed departs only 25° from an exactly radial position?

A. With the pointer arranged precisely as in the model, that is, in a line which is an exact radius of the gear wheel to which it is attached, the statement of the question is substantially correct in giving the degree of variation from a cylinder radius. When the pointer is arranged tangential to the cylinder, it stands at an angle of about 50° with the same radius of the cylinder passing through the center of the gear wheel to which the pointer is attached.

x-Q. 591. Did you ever mathematically review defendant's drawing No. 17, in connection with Mr. Stone's explanation of that drawing, for the purpose of ascertaining whether that diagram accurately represents what it purports to represent? I do not inquire for any other consideration of that subject than a close mathematical and geometrical analysis of Mr. Stone's work in making defendant's drawing No. 17 and explaining that drawing in his second deposition in this case; for that work, whether correct or incorrect, was very complicated, and its correctness cannot be either negatived or affirmed, except by one who has followed with minute accuracy every part of the mathematical process which Mr. Stone pursued in laying out that drawing.

A. I never have. I followed his description very closely and saw no reason to doubt the accuracy of the lines of that diagram, produced in the manner in which he made it.

[*Cross-examination ended.*]

[*Adjourned to Tuesday, Jan. 19, 1904, at 11 A. M.*]

Tuesday, Jan. 19, 1904, 11 A. M.

[*Met pursuant to adjournment.*]

Present—The Notary and counsel as before.

[*Complainant's counsel states that the witness Dayton is to-day sick at his hotel in New York, as counsel is informed by telephone, and unable to be here, nor does it appear definitely when he may be able to attend here, if necessary. Complainant's counsel, therefore, must for the present leave open the question of whether there will be any redirect.*]

[*Defendant's counsel hereupon consents to an indefinite adjournment of the taking of the deposition, with the understanding that complainant's counsel may, at his option, call the witness for redirect-examination at some time in the future, or may close the deposition without redirect-examination at some time in the future.*]

[*Thursday, Jan. 21, 1904. Complainant's counsel states that there will be no redirect-examination.*]

MELVILLE E. DAYTON.

Subscribed before me
January 21, 1904.

Arthur Brenton Cook,
[SEAL.] Notary Public,
Kings Co.

[*Cert. filed in N. Y. Co.*]

UNITED STATES OF AMERICA, }
Southern District of New York, } ss.:

I, Arthur Brenton Cook, a notary public having authority to act as such in the County of New York, State of New York, do hereby certify:

That Melville E. Dayton, the witness who gave the foregoing deposition, was by me first duly sworn to testify the truth, the whole truth and nothing but the truth; that his said deposition was reduced to typewriting by Miss Virginia L. Thornton, Miss Alice Fleming and Miss Elizabeth A. Williams, in the presence of said witness, and under my supervision and by consent of counsel, and read over by said witness, and thereafter subscribed by him in my presence; that said deposition was taken pursuant to notice and agreement of counsel at the office of Betts, Betts, Sheffield & Betts, at No. 120 Broadway, New York City, beginning on the 12th day of November and continuing, as noted in said deposition, by successive adjournments, to and including January 21, 1904, except that portions of the deposition taken on November 16 and December 1 were taken at No. 451 Washington street, Borough of Manhattan, in the City of New York, which portions, by consent of counsel, were there taken stenographically by me, in the presence of counsel, and thereafter written upon the typewriter by Miss Thornton from my dictation. That the parties were represented at the taking of said deposition by their

respective counsel, as set forth in said deposition; that the said witness lives at a greater distance than one hundred miles from the place of trial of this suit; that the several exhibits recited in the said deposition were offered in evidence and marked by me as specifically noted in said deposition. And I further certify that I am not of counsel or connected with either of the parties to said suit, or otherwise interested in the event thereof.

In Testimony Whereof, I have hereunto set my hand and official seal this 25th day of January, 1904.

ARTHUR BRENTON COOK,
Notary Public,
Kings Co.

[SEAL.]
Cert. filed in N. Y. Co.

IN THE CIRCUIT COURT OF THE UNITED STATES.
DISTRICT OF MAINE.

EASTERN PAPER BAG CO. vs. CONTINENTAL PAPER BAG CO.	On Liddell Patent No. 558969.

Evidence taken on behalf of the complainant in rebuttal before R. M. KELLY, Notary Public, pursuant to stipulation and agreement of parties herein under Rule 67 of the Supreme Court for courts in equity, as amended, at the office of Ernest Howard Hunter, 926 Walnut street, Philadelphia, beginning Friday, March 11th, 1904, at 12 o'clock noon.

[*Met pursuant to notice.*]

Present—SAMUEL R. BETTS, Esq., counsel for complainant.

ALBERT H. WALKER, Esq., counsel for defendant.

ERNEST HOWARD HUNTER, a witness produced on the part of complainant, having been first duly sworn to testify the truth the whole truth, and nothing but the truth, testifies as follows:

Direct-examination by MR. S. R. BETTS:

Q. 1. What is your name, age, residence and occupation?

A. Ernest Howard Hunter; 39; Germantown, Philadelphia; member of the Bar.

Q. 2. About how long have you been practicing your profession in Philadelphia?

A. Since 1887.

Q. 3. Are you acquainted with William Liddell, now or recently a resident of Brooklyn, N. Y.; and if so, about how long have you known him, and in what connection did you first meet him?

A. In the summer of 1893, when I was engaged in the preparation of applications on paper bag machinery for Ide, Haverstick & Co., I met Mr. William Liddell, a resident of Brooklyn, New York, who was engaged in Philadelphia in perfecting what was known as the Purvis bag machine. I saw Mr. Liddell, professionally, on several occasions between that time and January, 1896. I have not seen him since the latter date.

Q. 4. Referring to the year 1895, did you do any work in connection with Mr. Liddell's matters, professionally; and if so, state first in general terms to what that related?

A. In September, 1895, Mr. Liddell called upon me and explained some improvements in paper bag machinery invented by him which under an agreement with Ide, Haverstick & Co. he was to transfer to them; and he called upon me for the purpose of having applications for Letters Patent prepared on those inventions.

Q. 5. Who were Ide, Haverstick & Co.?

A. They were a Philadelphia firm of paper bag dealers, who, if I recollect correctly, were interested in the Eastern Paper Bag Co.

Q. 6. State here what your relation is to Mr. Rudolph M. Hunter, and how long you have been associated with him in business?

A. Mr. Rudolph M. Hunter is my brother. When I commenced the study of law at Philadelphia in the fall of 1885, I made my headquarters at his office for the purpose of familiarizing myself with the patent branch of the law. After my admission to the Bar in 1887 I became, and have continued to be, associated with him in business in the practice of my profession up to the present time.

Q. 7. During the years 1895 and 1896 where was your office located?

A. 926 Walnut street, Philadelphia, the present office.

Q. 8. Please fix the exact date in September, 1895, when Mr. Liddell called upon you, as you have stated, and indicate how you fix the date?

A. At the time Mr. Liddell called upon me and explained his inventions and I had decided what applications would be made, I gave a memorandum of the cases and charges to our

bookkeeper, William L. Evans, for the purpose of having the same entered in the books; and I find by reference to the ledger for this period under the date of September 23, 1895, the following entries:

Sep. 23	To Applic. Liddell Paper Bag Mach. Case 1	$65.00
" "	" Assg't & Recdg fee	3.00
" "	" Applics. Liddell Paper Bag Mach. Cases A & B,	130.00
" "	" Assg't & Recdg fee	3.00

These entries are in the handwriting of our bookkeeper, William L. Evans, and are the original first entry. We did not at that time keep a day book. I call attention to the fact that the date 1895 does not appear above these entries of September 23rd, but the date September 23rd appears after the entry of Nov. 16, 1894, and before the entry of Jan. 7, 1896, and the omission of the year was an oversight of the bookkeeper. I am also able to fix this date from the fact that on September 17th, 1895, I wrote in the name of my brother, R. M. Hunter, a letter to Mr. Albert Haverstick, making an appointment with Mr. William Liddell for September 23rd of that year, and I distinctly recollect that Mr. Liddell kept this appointment and placed these applications in my hands on that date.

[*Recess until 2 o'clock.*]

Q. 9. Now referring to the call made by Mr. William Liddell at your office in Philadelphia on business on September 23rd, 1895, please state your recollection of what occurred on that occasion?

A. My recollection of the matter is that Mr. Liddell had entered into an agreement with Mr. Haverstick for those he represented, that in consideration of his employment to perfect the Purvis machine, he was to assign to Mr. Haverstick, or those he represented, all inventions or improvements which he might make relating to the manufacture of paper bags. At about this time, that is September, 1895, Mr. Liddell's active work in connection with the Purvis machine was about to terminate, and he called at my office, as I understood, for the purpose of disposing all of the inventions or improvements

which he had made relating to the manufacture of paper bags. He brought with him some drawings and a wooden model, and we spent considerable time going over the subject. He explained his improvements to me in detail, and I decided what applications were to be filed, and placed the matter in the hands of the draughtsman, for the purpose of making the drawings. My conclusion was that it would be necessary to file two applications to cover all of Liddell's improvements, and it appears from the entry in the ledger, on September 23rd, 1895, the date of this interview, that three applications were charged for, identified as Cases 1, 2 and 3. We afterwards decided to file two applications only, and the first case was therefore crossed off the ledger, and the remaining cases were designated as Cases A and B. The applications upon the two cases A and B were prepared and filed and patents were granted upon them.

Q. 10. Can you state whether your brother, Rudolph M. Hunter, was present at this interview of September 23rd, you had with Mr. Liddell?

A. He was not, to the best of my recollection. Ide and Haverstick were clients of by brother's, Mr. R. M. Hunter, but as I had been looking after the Purvis application and had had previous dealings with Mr. Liddell, I took up the matter of his improvements with him instead of having the matter taken up by my brother.

Q. 11. What was the name of the draughtsman to whom was referred the matter of making drawings for these Liddell applications?

A. Henry Drury.

Q. 12. What is your recollection as to whether he was present at any portion of your interview with Mr. Liddell, or whether you referred Liddell to him, or communicated the matter yourself to Mr. Liddell on this occasion?

A. I have not now a sufficiently definite recollection of the matter to say which course was pursued. I am quite certain, however, either that Mr. Drury was called into consultation with Mr. Liddell at the time he disclosed his improvement to me, or that Mr. Liddell was sent to Mr. Drury and entered into explanations to him to enable Mr. Drury to make the drawings.

Q. 13. Did you thereafter have anything to do with the actual drafting of the specifications and decision as to sufficiency of the drawings while these cases A and B were pending in the office of your brother and yourself, between September 23, 1895, and Jan. 7, 1896, the latter being the date when they were executed by Mr. Liddell, prior to filing?

A. Sometime after September 23, 1895, when the matter was placed in the hands of the draughtsman, Drury, for the purpose of making the drawings, he informed me that he would have to have some further explanations from Mr. Liddell to enable him to complete the drawing, and on October 10th, 1895, I wrote a letter in the name of my brother to Mr. Liddell who had by this time returned to his home in Brooklyn, to come here for the purpose of making the necessary explanation, and on the same day, October 10, 1895, I wrote a letter, also in the name of my brother, to Ide, Haverstick & Co., informing them of the difficulty the draughtsman had experienced in the matter, and advising them that I had requested Mr. Liddell to come over to Philadelphia. Press copies of these letters appear on pages 348 and 349 of the Letter Press Book for that year. I note that through some peculiar reason these two letters are press copied twice, apparently because two sheets were wet and placed together. It appears that Mr. Haverstick was apprehensive as to whether the assignment of Mr. Liddell's application under the agreement with him would be affected by the delay that was occurring, and that the applications were not filed until after Liddell had severed his connection with Haverstick; and on October 12th, 1895, I wrote a letter also in the name of my brother, Mr. R. M. Hunter, to Mr. Haverstick expressing my opinion on the subject. A press copy of that letter will be found on page 353 of the Letter Book for that year. In this letter of October 12th, 1895, I advised Mr. Haverstick that Mr. Liddell had written that he would be here on Tuesday to go over the matter with the draughtsman, meaning by that the Tuesday following October 12, 1895. With the writing of this letter of October 12, 1895, my personal connection with the making of the drawings and the preparation and prosecution of the applications ceased, and I had no further connection with the matter until Jan. 7, 1896, when I took Mr. Liddell's affidavit to the

two applications in this office. While I had given personal attention to the paper bag cases prior to this time, and had at the start taken up these last matters with Mr. Liddell I presume that for some reason which I cannot now recollect, I was unable to give my attention to these particular applications, and therefore my brother, Mr. R. M. Hunter, took them in charge. I never had anything to do with the inventions excepting to have the first interview with Mr. Liddell on September 23, 1895, when he first explained his improvements to me and I turned the matter over to the draughtsman.

Q. 14. If Mr. Liddell came to your office in Philadelphia on the Tuesday after October 12, 1895, as your letter of October 12th, to Mr. Haverstick says Liddell wrote he would do, did he see you or your brother, R. M. Hunter?

A. I have no recollection of having seen Mr. Liddell at that time. If he came here his interview must have been with my brother or the draughtsman. As I find no letter in the letter press book either to Liddell or Haverstick, or Ide, Haverstick & Co. after October 12, 1895, referring to this promised visit of Liddell's, I suppose he must have come here, but if he did, I have no recollection of the matter.

Q. 15. You took no part in drafting the specifications or amending them prior to execution of these Liddell cases A and B, did you?

A. None whatever.

Q. 16. Can you fix the date from any memoranda in your possession, when these applications A and B were actually executed by Mr. Liddell?

A. I was at that time a notary public. Mr. Liddell executed the two applications before me, and I find on my notarial records the entry of these two affidavits on January 7, 1896. The entries are as follows:

7 Jan. William Liddell appln Paper Bag Mach A.

7 Jan. William Liddell appln Paper Bag Mach B.

This memorandum was made by me on Jan. 7, 1896, and was made in the regular notarial record which I kept for all affidavits and acknowledgments taken before me as notary.

Q. 17. Do you find in any of your books any entry in re-

gard to services rendered on said 7th day of Jan. 1896, in connection with either of these Liddell cases?

A. I do; on January 7, 1896, I find the following entry in the ledger in the handwriting of William L. Evans referring to these Liddell applications:

Extra drawings in laying out cams and movements Case A expert,	$10.00
Jan. 7, extra drawings Liddell cases A and B,	15.00

The first entry is the charge of my brother, Rudolph M. Hunter, for his time and services with Mr. Liddell on January 7, 1896, in laying out the cams and movements of the mechanism referred to in the application identified as Case A. The charge for extra drawings is the charge made to cover the cost of the additional drawings. It was at this time our custom in ordinary cases to charge an application fee of $65.00 inclusive of the first Government fee and one sheet of drawing, and it was the custom when a case was placed in our hands to make this charge of $65.00, and if the case required additional drawings, by that I mean more than one sheet, it was customary to add the charge for these additional drawings when the case was ready for filing. As it appears that these applications were executed on Jan. 7, 1896, and were then ready for filing, it was in order to send the bill to Ide, Haverstick & Co. for the fees, and therefore the charge for the additional drawings was made on this date, and I find by reference to the bill book for this period, that the bill to Ide, Haverstick, covering these items was sent on or about Jan. 10 (the date in the press copy book is obliterated partly, and is not decipherable), but the bill appears immediately after a bill of Jan. 10th and before one of Jan. 13, 1896.

[*Mr. Walker: All of this answer is objected to except the statement that the witness finds in the ledger in the handwriting of William L. Evans a particular entry or entries specified in the answer. All the rest of the answer being matter of inference on the part of the witness or being matter not called for by the question, and defendant's counsel particularly objects to the statement that it appears that the two applications in question were ready for filing on Jan. 7, 1896, there being*

no such appearance on the book referred to in the answer, and that hypothetical appearance being inconsistent with the deposition of Rudolph M. Hunter upon that subject.]

Q. 18. Now please state your recollection of what happened at your office on the 7th day of January, 1896, in connection with the visit there of Mr. William Liddell upon business relating to these two Liddell applications A and B?

A. Mr. Liddell came to our office on that day and had a consultation with my brother, Rudolph M. Hunter. I do not now recollect whether I was called into my brother's private office to take Mr. Liddell's affidavits to the applications, or whether Mr. Liddell brought the applications into my room, but he signed the papers and took the affidavits before me. I witnessed both of the specifications with my brother. I did not sign the drawings as a witness.

Q. 19. How distinct and certain is your recollection as to whether on this 7th day of January, 1896, Mr. Liddell had a consultation with your brother, R. M. Hunter?

A. I feel quite positive of it; my recollection is very distinct.

Q. 20. What is your recollection as to when in point of time any such consultation between William Liddell and your brother, R. M. Hunter, occurred; as to whether it was before or after Liddell swore to the applications A and B before you as notary?

A. The consultation was before Liddell executed the applications before me.

Q. 13. What was your custom and practice in carrying out your official business as notary at that time and prior thereto and since in respect to taking the oath of persons to papers or statements of various kinds as to whether you took such oaths in blank or with certain blanks to be filled in after the oath was taken, or with corrections to be made thereafter, or as to completeness of papers demanded by you as notary before you acted officially for taking oaths and acknowledgments?

[*Objected to as immaterial, the question being what occurred in this particular case and the custom of the witness in other cases, throwing little or no light upon that question.*

A. It was always my custom while I held a commission as a notary public to require that all documents executed before me should be complete. I should consider a practice of taking affidavits to a blank sheet or with material portions omitted and added to subsequent to the execution a highly reprehensible and illegal act, and I am not conscious of ever having done it intentionally. I have no reason for supposing that any different pactice was followed in the case of the Liddell application. If I had not considered them complete and in proper form I would not have taken Mr. Liddell's affidavits.

Q. 22. What is your recollection as to the actual applications in question, these Liddell applications A and B, as to the form and completeness thereof at the time you took Mr. Liddell's oath to said applications on Jan. 7, 1896?

A. To the best of my recollection they were complete and in proper form.

Q. 23. Did Mr. Liddell raise any objection to signing said applications on that occasion?

A. None whatever.

Q. 24. Your name appears as a witness to the specifications of both these applications as executed and filed; did you actually see Mr. William Liddell sign his name to these papers on Jan. 7, 1896?

A. I cannot say, whether I did or not. Mr. Liddell either signed the papers in my presence, or had signed them immediately before I took his affidavits, and I cannot say which happended. I may not have been in the room at the particular moment when he wrote his name; very frequently a document is signed before it is sworn to. I cannot say whether that happened or not. However, Mr. Liddell was present when I witnessed his signature to the specification, and if I did not see him sign the papers I took his statement of the oath as a proper acknowledgment of his signature.

Q. 25. What is your recollection as to whether Mr. Liddell was hurried or urged in any way in connection with signing these two applications?

A. I know of no reason why he was hurried or urged in any way whatever; it was my understanding when he came here on that day that he came for the purpose of having the papers

put in order so that they could be executed by him and filed, and so far as I recollect he had nothing else to do while he was here but to attend to that matter. It occurred so long ago that it would be impossible for me to recollect exactly how much time he spent on the subject.

Q. 26. Was anything said in your presence or any suggestion made of the time that he should sign the papers and execute them and it would be all right, or that changes would be made thereafter, or that the papers would be completed thereafter?

A. I have no recollection of any such thing. I know that if the papers were apparently incomplete upon their face I would not have consented to take his affidavits.

Q. 27. Did it in any way come under your observation subsequent to this 7th day of January, 1896, that the papers in either of these applications A and B were being changed or corrected or completed after Liddell's name had been signed thereto. You understand, of course, I am in these questions not referring to the drawings which do not bear your signature?

A. I have no recollection of any changes, or alterations or recopying of the specifications of the Liddell's applications after they were executed by him and before they were filed in the Patent Office.

Q. 28. What typewriting force did you have in your office on January 7, 1896?

A. I cannot recollect positively, but we had two and possibly three typewriters. The two of whom I am positive are William L. Evans and Miss R. M. Kelly.

Q. 29. Have you made or assisted in any search for the original sketches and working model you have stated were submitted to you by Mr. Liddell on September 23, 1895?

A. I have caused as thorough and careful a search as I was capable of instituting for the purpose of discovering the drawings and the model, both in this office and in the offices occupied by the draughtsman, Drury, but have been unable to find any of them, and have not the slightest idea what became of them. I believe they were all handed over to the draughtsman, Drury, and were apparently never returned. Drury reported to me that he had made careful search of his offices and was

unable to find the model or any drawings referring to the subject.

[*Direct-examination closed.*]

Cross Examination by MR. WALKER:

x-Q. 30. Is the lady, Miss R. M. Kelly, who is taking this deposition down in typewriting, the same person who was one of the typewriter operators in this office in January, 1896?

A. Yes.

x-Q. 31. Was she, or was Mr. Evans, the most skilful and more generally employed typewriter operator in this office at that time?

A. I should say that at that time most of the typewriting was done by Miss Kelly, as Mr. Evans had other duties to perform besides his typewriting.

x-Q. 32. Did you at that time occupy as your personal office the same front room which you thus occupy now and in which this deposition is being taken?

A. I did.

x-Q33. Did R. M. Hunter at that time occupy as his private office the same rear room which I see now as being behind an intermediate room, and which intermediate room appears to be occupied by the clerks of the establishment?

A. He did, and you are quite right with reference to your understanding as to the intermediate room.

x-Q. 34. Was it the case in January, 1896, that the entrance for clients into the establishment was into the intermediate room, and not directly into the private office of R. M. Hunter, nor directly in your office?

A. It was.

x-Q. 35. Now when William Liddell came to the establishment on January 7, 1896, he first entered the clerks' office and was shown from that office into the private office of R. M. Hunter, as you understand?

A. I have no recollection of the matter whatever. I presume he must have entered that way as it was the only way he could have entered.

x-Q. 36. Did you see William Liddell that day, prior to the particular time when you were asked to witness his signature and administer the oath to him in respect to those two applications?

A. I have not the slightest idea. I know he was here and in consultation with my brother in his private office; whether I saw him when he entered, had any conversation with him before he entered my brother's private office is a matter which I could not possibly recollect now.

x-Q. 37. Do you remember whether your brother and yourself signed your names to the papers which you witnessed in the presence of each other?

A. I really do not know; if, as I think, was the case I took Mr. Liddell's affidavits in Mr. R. M. Hunter's room, it is probable that I signed as a witness when I brought the papers into my room to affix my notarial seal.

x-Q. 38. Now it is conceivable that your brother brought or sent Mr. Liddell into your room to make the oath before you, and it is conceivable that you went into your brother's room for that purpose, and it is conceivable that all three of you went into the clerks' room together to do the business, and I inquire of you whether you have any distinct recollection as to which of these three conceivable courses was really taken?

A. While it might be possible, I would say that it was highly improbable that the latter method was pursued. As to which of the other two was in fact followed, I have not the slightest recollection, and I think that I have already so stated in my direct examination.

x-Q. 39. What is the foundation of your statement that a consultation between your brother and Mr. Liddell occurred relevant to those applications on January 7, 1896, before you administered the oaths to Mr. Liddell?

A. In offices arranged as our's are it is hardly possible, unless I am in consultation with my door shut not to know who enters the office, and I am usually aware who is in consultation with my brother. I kept myself thoroughly informed with regard to the business of the office even in those matters to which I was not giving personal attention. To the best of my recollection I am sure that Mr. Liddell was coming here for the purpose

of completing his applications, and I would have considered it my duty to inform myself when he arrived so that I might be here to take the affidavits when he was ready. I have, what I believe, a very distinct recollection of Mr. Liddell being here in consultation with my brother on that day before the applications were executed.

x-Q. 40. Did you learn on that day that any change in the applications or either of them had been suggested on that day to be made?

A. It is my recollection that the reason Mr. Liddell came here to execute the application instead of executing them in Brooklyn, was because it was necessary for him to make some further explanation to put his application in proper form and I understood that that was done.

x-Q41. Your brother has testified that he consulted with Mr. Liddell about those applications on Jan. 7, 1896, and that as a result of that consultation, he himself with his own hand changed the specification of one of the cases quite extensively, and your brother has produced several sheets of paper covered with writing in his own handwriting which he testifies were written by himself on that day in making those changes; and your brother has testified that the specification which went to the Patent Office in that case was a new and fair copy of the original specification which he had prepared sometime before, as that original specification was amended by him in those written sheets on January 7th, 1896. Now I ask you if you had any personal knowledge whatever of that history as it occurred on Jan. 7, 1896, or at any other time before the end of January, 1896?

A. I have a very distinct recollection that the Liddell applications, one or both, were not in condition to be executed and filed by him, and that he came to this office on January 7, 1896, for the express purpose of explaining to my brother, R. M. Hunter, what was necessary to put the applications in proper form. I have a distinct recollection that Mr. Liddell and my brother were in consultation on the subject, and I understood that the necessary correction had been made. As I did not personally take any part in the preparation of the application I have no knowledge whatever of what those alterations or correc-

tions consisted. I have a distinct recollection that after the consultation between my brother and Mr. Liddell, Mr. Liddell executed the two applications before me on January 7th, 1896. To the best of my recollection and belief the specification forming part of the applications which were executed by Mr. Liddell on that day before me were complete and proper applications. Further than this I have no personal recollection of anything that occurred in this behalf on that day.

x-Q. 42. Did you have anything whatever to do with either of those applications after January 7th, 1896?

A. Nothing whatever.

x-Q. 43. Do you now have any knowledge of your own as to what was done with either of those applications after January 7, 1896?

A. I have referred to the records of our office with reference to the filing of the two applications as I did not understand why the application on Case A was filed after the application on Case B. It appears that application on Case A was sent to the Patent Office Jan. 27, 1896, but that the drawings, or one of them, was not signed through some inadvertence, and consequently the completed applications papers were not on file until February 6, 1896.

x-Q. 44. Please answer x-Q. 43, which is as you will see, is confined to your own knowledge, and does not contain any inquiry as to the records of your office?

A. Further than I have stated in my last answer I have no knowledge of anything that was done in connection with these applications after they were executed before me on January 7, 1896.

[*Adjourned to Saturday, March 12, 1904, at 9:30 A. M.*]

PHILADELPHIA, Saturday, March 12, 1904, 9:45 A. M.

[*Met pursuant to adjournment.*]

Present: As before.

Cross Examination of the witness, ERNEST HOWARD HUNTER, *resumed by* MR. WALKER:

[*Defendants' counsel states to the Court that when he was*

about to put the first question of to-day to the witness, Mr. Betts requested the witness go into an adjoining room and allow Mr. Betts to speak to him; whereupon defendants' counsel said, "Mr. Betts, I am not willing that you should confer with "the witness in my absence," to which Mr. Betts responded, "I am going to."

[And now defendants' counsel objects to private conference between complainant's counsel and the witness at any time between the beginning and the ending of the cross-examination.

[Mr. Betts states that his conference with Mr. Hunter and what he said to him did not in any way relate to Mr. Hunter's testimony in this case, but did relate to a matter which he thought proper to inform Mr. Hunter about at the first opportunity in view of what Mr. Betts found it necessary to do in Mr. Hunter's office after the adjournment of this testimony yesterday afternoon, and that he did inform Mr. Hunter of the fact that Mr. Albert H. Walker, after the adjournment of the testimony yesterday afternoon, and in the absence both of Mr. R. M. Hunter and Mr. E. H. Hunter, was observed by Mr. Betts engaged in an endeavor to obtain information from the clerk in Mr. Hunter's office, Miss Kelly, in relation to whether or not she did any typewriting of this Liddell application A, against which Mr. Betts took occasion to protest as highly improper under the surrounding circumstances, and to warn Miss Kelly that under the circumstances she should not talk about the matter, and that Mr. Betts having gone out and then returning forthwith in regard to putting away some of the papers, found Mr. Walker still engaged in this apparent endeavor to obtain information from Miss Kelly on the subject in the absence of her employers, both of whom are witnesses in this case, and Mr. Betts again protested against such conduct as improper and unprofessional under the circumstances. This was what he was just now talking about to Mr. Hunter, and the matter would not have been put on the record except that Mr. Walker has put thereon a statement which suggests or insinuates that the witness has been improperly coached.

[Defendant's counsel states that he regrets that Mr. Betts should insert in the record an unsworn statement of his own in an endeavor to reflect upon the professional conduct of defend-

ant's counsel; but inasmuch as he has done so, defendant's counsel finds it to be his duty to state all the facts to the court, which facts were as follows in their entirety:

[The adjournment yesterday afternoon occurred at half-past four at the request of Mr. Hunter in order to enable him to hurry away to prepare for another engagement, and Mr. Hunter did immediately depart; and Mr. R. M. Hunter had left the establishment sometime before; thereupon Miss Kelly, the notary, taking the deposition went into the clerk's office, leaving Mr. Betts and Mr. Walker alone together in Mr. E. H. Hunter's office; thereupon Mr. Walker said to Mr. Betts, "I wonder if Miss Kelly did not write the copy of the specification of Case A which was sent to the Patent Office," and Mr. Walker added, "Why don't you ask her;" thereupon Mr. Betts said, "You ask her;" thereupon, without any previous intention so to do and prompted only by the suggestion of Mr. Betts, Mr. Walker passed through the open door from the office of Mr. E. H. Hunter to the clerk's office, followed by Mr. Betts, and Mr. Walker said to Miss Kelly, in the presence of Mr. Betts, "Did you write that specification that went to the Patent Office?" Thereupon Mr. Betts called out to Miss Kelly a peremptory order, request or suggestion in the following words, "Don't you tell him, Miss Kelly;" thereupon Mr. Walker asked Miss Kelly if she could identify her own typewriting when it might be shown to her;" whereupon Mr. Betts told Miss Kelly not to answer that question; thereupon Mr. Betts left the room apparently for his hotel, and while Mr. Walker was preparing to go to his hotel by getting on his overshoes and putting on his overcoat, he said to Miss Kelly, "I suppose there would be no objection to my giving you information," and he was about thereupon to state to Miss Kelly that he had seen the files of the application in the Patent Office, but before he had made any statement to Miss Kelly pursuant to that intention Mr. Betts returned, and with symptoms of considerable ill-nature undertook to censure Mr. Walker for asking Miss Kelly the questions which Mr. Walker had asked her in the presence of Mr. Betts. Thereupon Mr. Betts went away to his hotel presumably and Mr. Walker went away to his hotel without any further conversation with Miss Kelly except to say "good afternoon."

[*When Mr. Betts requested the witness to allow him to speak to him privately at the beginning of the session this morning, Mr. Walker was about to put to the witness the following question "Have you any objection to Miss Kelly telling me whether she wrote the copy of the specification of Liddell case A, which was sent to the Patent Office in typewriting January 27, 1896?"*

[*Defendant's counsel thinks he foresees that Mr. Betts will undertake to contradict the foregoing statement of defendant's counsel, and if Mr. Betts does so, Mr. Walker will ascribe the contradiction to failure of memory on the part of Mr. Betts but whether or not such a contradiction is undertaken by Mr. Betts, the incident will show the impropriety of the original statement which Mr. Betts inserted in the record this morning.*

[*In addition to the impropriety which is apparent upon the face of that statement, defendant's counsel adds that he has never put any question about this case to Mr. Drury or to Mr. Evans, and he never saw either of those men or had direct or indirect communication with them at any time on any subject so far as he can remember, and certainly not at any time during the last ten years, and that he never sought any information from Miss Kelly relevant to this case except the two questions which he put to Miss Kelly yesterday afternoon in the presence of Mr. Betts, and neither of which questions would have been put to her on that occasion if Mr. Betts had not suggested the idea as above set forth.*

[*Mr. Betts says that Mr. Walker's statement that he, Mr. Betts, suggested to Mr. Walker questioning Miss Kelly on the subject of her typewriting these Liddell applications or in any connection, is an absolute misstatement on the part of Mr. Walker without any foundation whatever, as is clearly shown by Mr. Walker's own statement that the moment Mr. Walker began to attempt to question Miss Kelly Mr. Betts vigorously, strenuously and emphatically protested against any such conduct.*]

x-Q. 45. Have you any objection to Miss Kelly telling me whether she wrote the copy of the specification of Liddell case

A, which was sent to the Patent Office in typewriting January 27, 1896?

A. I have no objection whatever to Miss Kelly giving you any information she may be able to give in regard to this case at the proper time and under proper conditions, but I must object to any attempt to examine Miss Kelly or any other employee of this office with regard to this case or any other matter whatever in the absence and without the knowledge of my brother and myself.

x-Q. 46. I now show you "Complainant's Exhibit Hunter File of Case A," which document was sworn to by your brother in his deposition as being the file kept in his office of all the papers except the drawings of the Liddell application No. 578291, filed Feb. 6, 1896; and I call your attention particularly to the twelve pages of black typewriting in that document, and which twelve pages your brother testifies were the carbon copies which he retained in his office of the body of the specification in Liddell Case A which he sent to the Patent Office January 27th, 1896, and which constituted a part of the completed application No. 578291 which was filed in the Patent Office February 6, 1896, and I ask you whether you are willing that I should now hand those twelve pages of typewriting to Miss Kelly in your presence and in the presence of Mr. Betts and should ask her whether she did that typewriting?

[*Complainant's counsel has no objection to that information being given at a proper time and under proper conditions, but does object to any attempt to drag in the testimony of Miss Kelly either by statements of counsel or otherwise into the deposition of Mr. Hunter; therefore he objects to such question being asked Miss Kelly during the actual taking of this testimony, or in any way that shall bring in such statements as she may make as part of the record now being made.*]

[*Defendant's counsel states that he has not intended to try to get any statement from Miss Kelly into the present deposition, but that he does desire the present witness to answer the present question.*]

[*Complainant's counsel further objects to the question as entirely immaterial, not founded on the direct-examination, and*

not proper cross-examination, and as attempting something entirely foreign to this deposition and to the regular and orderly practice of taking depositions; since if the question is answered in the affirmative, it has no materiality unless Miss Kelly is then asked the question suggested and answers it, and this proceeding becomes a matter of record which is manifestly improper under the ordinary rules of evidence.]

A. Personally I have no objection whatever to your asking the question now or at any time, but it would seem to me that whether this is the proper time or manner for asking the question is a matter which must be decided by complainant's counsel, and in view of the fact that complainant's counsel has indicated upon the record an objection, I must decline to give my consent to asking the question at the present time.

x-Q. 47. Are you willing that I should show those twelve sheets of typewriting to Miss Kelly immediately after the completion of your deposition, and shall thereupon in your presence and in the presence of Mr. Betts ask her to inform me whether she made those twelve sheets of typewriting, and made the ribbon duplicate which your brother testified was made with the twelve sheets in question?

A. I have endeavored to very positively indicate that I have no objection to your asking the question at any time, but whether or not that question shall be asked in some particular manner, or at some particular time is a matter which concerns counsel in this case, and not me, and I consider that it would be unfair under the circumstances for me to authorize or request Miss Kelly to give the information in any particular manner or any particular time which might be considered objectionable by either of the counsel in this case.

x-Q. 48. If Mr. Betts will consent to the proposition of my last question, will you consent to that proposition?

A. I consider that that is a matter with which I have nothing to do; I have signified my consent that Miss Kelly may be questioned by counsel at any time that it may seem proper to them.

[*Defendant's counsel requests complainant's counsel to state now upon the record whether he is willing that immediately after the completion of this deposition I should show those*

twelve sheets of typewriting to Miss Kelly in the presence of Mr. Betts and have her to inform me whether she made those sheets.]

[*Complainant's counsel will answer that question when this deposition is closed.*]

x-Q. 49. Please to look at the twelve sheets of black carbon typewriting which are contained in Complainant's Exhibit Hunter File Case A, and state whether you know what typewriter operator made those twelve sheets and made the ribbon duplicate thereof which your brother testified was sent to the Patent Office as the body of the specification of Liddell Case A on January 27th, 1896?

A. I have no idea; I presume from the fact that they appear in our file that they were made by one of the employees of the office at the time the application was prepared for execution by Mr. Liddell, but that is merely my presumption; I know nothing about it whatever.

x-Q. 50. Where is Henry Drury now?

A. I believe that Henry Drury is at present employed by the Dupont Powder Company at Wilmington, Delaware, but I believe still resides in this city; I do not know his house address.

x-Q51. Where is William L. Evans now?

A. He resides in Philadelphia; I do not know his address nor his place of employment.

x-Q. 52. Have you ever during the last year or two talked with Miss Kelly or with Henry Drury or with William L. Evans about the history of the Liddell application Case A, which was sent to the Patent Office somewhat incomplete in respect of the drawing on January 27th, 1896, and which was filed in the Patent Office February 6, 1896, as No. 578291?

A. Sometime ago the exact time I do not now recollect, but perhaps a year ago, Mr. Francis T. Chamber of the Philadelphia Bar, who is, I believe connected with this case, asked me to look up our records to ascertain as far as I could the history of these two Liddell applications under consideration. I had the assistance of Miss Kelly in hunting up the records and talked to her to such an extent as may be necessary for that purpose.

At the same time I sent for Mr. Drury and told him about the drawing and model, and asked him to institute a search of his premises to see whether he had them.

I have never had any conversation with William L. Evans upon the subject.

x-Q. 53. Was Mr. Drury or was Miss Kelly able to remember anything definite about the history of the Liddell application Case A when you investigated the history of the two Liddell applications at the request of Mr. Chambers about a year ago?

[*Objected to as incompetent, calling for hearsay evidence, or worse yet, for the witness' impression of hearsay.*]

A. I have no idea at all whether they remembered anything definite about the application or not.

x-Q. 54. Now carry your mind back to the 7th January, 1896, and state whether on that day you saw any drawings of any thing which you understood to be described in either of the Liddell applications which you say Mr. Liddell executed before you on that day?

A. I cannot say that I have any definite recollection of seeing the drawings on that day, but there is a decided impression in my mind that my brother had the drawings before him in his room during the time Mr. Liddell was with him. It seems to me now that I went into Mr. R. M. Hunter's room to take Mr. Liddell's affidavit and I think the drawings were there. However, I am not by any means positive upon this point, although the impression on my mind is decided.

x-Q. 55. No signature of William Liddell, nor any copy of any signature of his appears anywhere in Complainant's Exhibit Hunter File Wrapper of Case A. But your brother explained in his deposition that in accordance with the custom of his establishment the signatures of inventors are regularly written upon a printed blank folder used in the office, and that the first page of that blank folder consists of the petition to the Commissioner of Patents, and that the last page of that blank folder begins with the attestation clause of the specification and is followed by the affidavit of the inventor and is concluded with the jurat of the notary; and that on January 7, 1896, Will-

iam Liddell signed his name at the bottom of the petition on the first page of that printed folder and then signed his name just below the attestation clause of the specification, and then signed his name a third time at the bottom of the affidavit, and that the body of the specification in typewriting was as is customary in this establishment inserted between the two leaves of the blank folder, so as to make a continuous document or collection of documents consisting of the petition signed by the inventor and followed by the body of the specification in typewriting not signed by the inventor and followed by the attestation clause of the specification clause signed by the inventor and followed by the affidavit signed by the inventor and followed by the jurat signed by the notary; but your brother gave his deposition in New York where he did not have one of those blank folders with him, and therefore he had to rely upon his statement for showing its character. Now I do not understand that there is any question anywhere of the correctness of your brother's testimony on this point, but to enable the court easily to understand the matter I ask you to produce one of the blank folders customarily used in this office, so that the court can see for itself how the petition signed by Mr. Liddell and the attestation clause on the specification signed by Mr. Liddell and the affidavit signed by Mr. Liddell should be combined with the twleve pages of blank carbon typewriting in Complainant's Exhibit Hunter File Case A in order to make up a complete duplicate of the application papers which were filed in the Patent Office in that case?

[*Objected to as the original documents on file in the Patent Office are the best evidence of exactly how the specification was signed as filed, also an incorrect summary of Mr. R. M. Hunter's testimony, and particularly the sentence "and followed by the body of the specification in typewriting not signed by the inventor" is criticised as without foundation in the evidence, and a misleading statement.*]

A. I presume that by the "blank folder" you refer to the usual printed application blanks. Of course I do not know anything about the statements you have put upon the record with regard to my brother's testimony, as I have not read it.

I produce one of our application blanks. This is probably not identical with the application blanks which we used in January, 1896, but so far as the arrangement of the petition and preamble on the first page and the attestation clause and oath on the last page is concerned, it correctly represents the application blanks which were used in January, 1896, in this office. We have been using application blanks of this kind ever since I have had any connection with this office.

[*Defendant's counsel offers in evidence the two sheets of printed blanks produced by the witness and requests that they be marked "Defendant's Exhibit Hunter Application Blanks, Part 1 and Part 2," respectively, and they are accordingly so marked.*]

x-Q. 55. Now am I right in understanding that the signatures which Mr. Liddell made to his application Case A on January 7, 1896, were three in number, and that the first of those signatures consisted in writing his name immediately under the petition to the Commissioner of Patents on the face of such an application blank as Part 1 just offered in evidence, and that the second of those signatures consisted in writing his name under the attestation clause near the top of such a blank as Part 2 just offered in evidence, and the third of those signatures consisted in writing his name under such an affidavit as that which is printed in the middle portion of said Part 2, and that the two blanks before they were signed by Mr. Liddell were filled up properly with his name and place of residence and with the statement that the invention referred to therein was an improvement in paper bag machines?

[*Objected to as the record is the best evidence.*]

A. I believe you are quite right in your understanding, but the original application at Washington will show how the application was signed.

x-Q. 56. Now state whether when Mr. Liddell thus signed those two printed blanks and made oath to the affidavit contained on Part 2 thereof, you particularly scrutinized whatever sheets of paper were between the two parts of that blank or

were otherwise in company with that blank, so as to know the contents of any such sheets of paper on the one hand, or whether on the other hand, you simply noticed that there was considerable manuscript somehow attached to the two sheets and naturally assumed that that manuscript was the specification which Mr. Liddell was swearing to?

A. While I was acting as a notary public it was not my custom to read the specification of applications prepared by my brother and not by me before I administered the oath to the applicant, and I am quite positive that I did not read the specification in this case. The application contained what appeared to me to be, and what I thoroughly believed to be, a full specification and claims in perfectly proper form as a complete application ready for filing.

x-Q. 57. Did you turn over the sheets of any manuscript which accompanied the two blank sheets which Mr. Liddell signed and observe that those sheets of manuscript were arranged in due order according to their pages, so that if read in the order in which they were arranged they would read consecutively; or did you simply assume that they had been properly prepared and arranged without taking pains to verify that proposition personally?

A. I have not the slightest idea whether I so examined the papers or not; it would be impossible for me to remember a special examination made of any application executed before me eight years ago. There was nothing in the execution of the Liddell application that would particularly impress upon my mind such a proceeding on my part as that suggested in the question. It was my custom to examine all papers which were executed before me in what I considered a sufficient manner to satisfy me that they were in proper form.

x-Q. 58. Did you notice how the two blank sheets were attached to the manuscript of the specification, or did you notice that they were attached to that manuscript at all when Mr. Liddell signed his name at the three places on the two blank sheets, and when he took the oath which you administered to him?

A. The sheets were certainly all fastened together; I have

no recollection now in what manner, but I think that would be shown in an examination of the application in the Patent Office. If I am not mistaken the blanks which we used in 1896 had the two printed pages connected together at the top, and the typewritten copy of the specification and claims was inserted between them. As we discovered that these pages were separated at the top by the Examiners in the Patent Office we changed the method and had the two printed pages of the form on detached sheets.

x-Q. 59. Did Mr. Haverstick accompany Mr. Liddell to this office on January 7, 1896?

A. My impression is very decided that he did not, but I am not sure. I have no recollection of having seen Mr. Haverstick on that day.

x-Q. 60. I observe in your notarial record that you on January 7, 1896, administered oaths to patent applications in two cases other than the two Liddell cases; the first of the four cases appearing to be an invention of R. M. Hunter and the last of the four cases appearing to be an application of Warren A. Hawley; now please to state whether the Liddell applications were executed after the Hunter application and before the Hawley application as would appear upon the face of your record?

A. I have no recollection of the order in time in which the four applications were executed. However, as it was my custom to make the entries in my record immediately after administering an oath or taking an acknowledgment, I presume that the Liddell affidavits were taken sometime between the Hunter affidavit and Hawley affidavit.

[Adjourned to Thursday, March 17, 1904, at New York, at the office of Betts, Betts, Sheffield, & Betts, 120 Broadway, at 11 A. M., said adjournment being by consent of counsel, and it is agreed that the testimony may proceed in New York before some local notary not objected to by either side and that the continuation of the deposition thus taken before the local notary may be sent by him to the present notary, Miss Kelly, and

may be certified by her with the same effect as if she had taken that continuation of the deposition personally.]

[*Attest.*]

R. M. KELLY,
Notary Public.

Wednesday, March 16, 1904,

At the Office of Betts, Betts, Sheffield & Betts,

120 Broadway, Manhattan, New York.

Present—SAMUEL R. BETTS, Counsel for the Complainant.
ALBERT H. WALKER, Counsel for the Defendant.
ARTHUR BRENTON COOK, Notary Public.
ERNEST HOWARD HUNTER, Witness.

[*In pursuance of agreement of counsel on both sides, the taking of the deposition of Ernest Howard Hunter is now to be continued at this time and place, in the presence of Mr. Cook, as Notary Public, with the understanding that the continuation of the deposition thus to be taken is to be sent by him to Miss R. M. Kelly, 926 Walnut street, Philadelphia, Pennsylvania, the notary before whom the preceding part of the deposition was taken, said continuation to be added by her to the part of the deposition taken by her, and the whole to be certified by her with the same effect as if she had taken the whole deposition personally.*]

Continuation of Cross Examination by MR. WALKER:

X-Q. 61. Do you remember any fact which occurred on January 7, 1896, in respect of the oath which you administered on that day to your brother Rudolph M. Hunter, in connection with his application for a patent on one of his inventions?

A. None whatever. I administered so many affidavits to my brother Rudolph M. Hunter at that period that it would be impossible for me now to recollect anything with reference to the oath that was administered on January 7, 1896. I note,

however, by reference to my notarial record, that it was an oath to an application for a patent.

x-Q. 62. Do you remember any fact which occurred on January 7, 1896, in respect of the oath which you administered on that day to Warren A. Hawley, in connection with his application for a patent on an invention of his?

A. I recollect the Hawley application very well, but I cannot say that I have any distinct recollection of what occurred in connection with the administration of the oath to him in connection with that application on January 7, 1896.

x-Q. 63. On that day the sun went down about half past four in the afternoon, and I inquire whether the business in your office was closed for the day at or before sundown, or whether it continued later with artificial light?

A. As a general rule our office is open, excepting on Saturdays and holidays, until nearly six o'clock. We use artificial light when it is necessary.

x-Q. 64. Do you remember whether the Hawley application was sworn to before the end of daylight, or not until after daylight ended?

A. I haven't the slightest idea.

x-Q. 65. Do you remember whether you administered the two oaths to Mr. Liddell, to go with his two applications, at the same time, or at different times, on January 7, 1896?

A. I have no positive recollection. I think I administered both oaths at the same time, or rather one oath to both affidavits, but I have no positive recollection.

x-Q. 66. Do you remember whether those oaths were administered before the end of daylight, or after daylight ended?

A. I have no recollection whatever of the time of day when the oaths were administered.

x-Q. 67. Did you see any blue prints on that day, which you understood had been made from any drawings belonging to either of the Liddell applications?

A. As I believe I stated before, I have a decided impression, although I can hardly call it a recollection, that the drawings were made before my brother R. M. Hunter in his room on the day in question, and that I saw them there. I think there were

blue prints also, but I cannot say positively; my recollection is not sufficiently clear.

x-Q. 68. Do you remember definitely whether any third person was in your immediate presence [illegible] being done, when you administered any oath to Mr. Liddell on January 7, 1896?

A. I cannot say positively whether my brother Mr. R. M. Hunter was present or not at the particular moment when I administered the oath. If I administered the oath in his room, he was present. If Mr. Liddell came into my room, he may or may not have been present. I have no definite recollection.

x-Q. 69. How many windows admitted daylight in the daytime into your brother's room on January 7, 1896?

A. The room has a skylight and, I think, one window. If the front and back doors are open, light is also admitted from the adjacent rooms.

x-Q. 70. The window was an east window, was it not, and the light coming into that window was reduced by the presence of the walls of another building a short distance to the eastward, and another wall a short distance to the south of that window, and also another wall a short distance to the north of that window; so that the window opened into a rather narrow space, walled on all four sides?

A. It is an east window, but you are entirely mistaken in other respects.

xQ. 70-1/2 Please to fix your mind upon the space just outside of that window, and state whether there is not a wall within eight or ten feet of the inside of that window?

A. I have never measured the distance. The room in question is a one-story extension of the original building, which we had made for the purpose of extending our offices. While only one story high, it is of the width of the usual extension of a residence, such as you find almost everywhere in the old section of Philadelphia. That is to say, there is left a fairly wide passage-way between the side of the extension and the building line. The house next door also has an extension, with a similar passage-way, between its side and the building-line. This extension of the building next door is three stories high, if I recol-

lect correctly, but the space between the extensions of the two buildings is the space that is usually found in residence buildings of this kind in the City of Philadelphia, and is considered ample for the purpose of giving light. The back yards are entirely open towards the south, and there is no obstruction.

x-Q. 71. What room was south of your brother's private office, with a door between?

A. A small storage room, which has a window on the east and a door opening out into the yard.

x-Q. 72. Your own office was at the north end of the establishment, and was originally the parlor of a private residence, was it not, while the clerk's room was between your room and your brother's private office, and was originally the back parlor of the private residence, with a wide opening for folding doors between the two parlors, but which wide opening was closed by a partition provided with a comparatively small door, was it not, when you were using the premises in January, 1896?

A. Your description of the relative location of the rooms is correct, except that the partition dividing my office from the middle office does not extend entirely up to the top of the arch, and there is therefore left above that partition an open space through which light and, I am sorry to say, sound travel.

x-Q. 73. How many clerks altogether were employed in that middle room in January, 1896?

A. There were two or three and an office boy. I am certain of two; I am not certain whether we had a third clerk there at that time or not.

x-Q. 74. About how large was the skylight in the ceiling of your brother's private room?

A. I am very poor at estimating dimensions. I should say it was about eight feet square.

x-Q. 75. It is true, is it not, that your brother in January, 1896, had been for many years a prolific inventor in many different arts, and also an extensive solicitor of patents, and that his private room was crowded with books, papers, models and miscellaneous matter, loading the tables, desk, window-sills, and even the floor, so that it was difficult to find room for

anybody except himself to do any deliberate work, examining complicated figures and drawings, in that room?

A. My brother is, and had been prior to January, 1896, a prolific inventor, and also an extensive solicitor of patents. It is true that his room was very much filled with books, papers, drawings, etc., perhaps more so than would be pleasing to a tidy housewife, but I am not aware that the apparent untidiness of his desk and office has ever interfered with his ability to transact with reasonable convenience and comfort any business which it has been necessary for him to transact since he has occupied that office.

x-Q. 76. It is true, is it not, that your own room contains great quantities of books, models, papers, and drawings and miscellaneous matter, crammed into the shelves, piled up on the floor, overflowing into the chairs and loading down your desk, so that not more than two or three square feet of unoccupied table-space can be found in that room, which small space is near the middle of your own desk and is occupied by you, and is surrounded by large masses of miscellaneous matter, similarly to the desks and tables of many busy lawyers? And it is also true, is it not, that no table was provided anywhere in the establishment in January, 1896, where a client could go and spread out a complicated set of drawings and application papers and study them up himself so as to see whether they were right or wrong?

A. No, it is not true. My room contains many models, which, for lack of storage facilities, I am compelled to keep there while they are or may be required in connection with any pending suit or matter. Personally, I endeavor to keep my papers in good order, and periodically my desk is thoroughly cleared up. I presume at the time you saw it recently in Philadelphia, at a time when I was so busily engaged that I could not dispose of all the little matters which required my attention, my desk was in a very much littered condition, but that is not its condition at the present moment, and I should feel sorry to have you consider that it is normally in that condition. I have, and have had for many years, a table beside my desk, which is intended for the purpose of enabling the examination

of large blue prints and drawings, and which is now, and has been for many years, constantly used for that purpose, and I find it amply sufficient for the purpose. This table was in my room at the time I met Mr. Liddell in connection with his application in September, 1895, and was used for the purpose of enabling Mr. Liddell to display the drawings which he had. My recollection of this is very distinct, and there can be no mistake about it.

x-Q. 77. What became of those dawings ultimately?

A. I have already stated that they were given to the draughtsman, Drury, and that neither he nor we has nor have been able to find them.

x-Q. 78. Have you any definite recollection that Mr. Liddell was inside of your old room at any time on January 7, 1896?

A. I have already stated that I have no definite recollection whether I administered the oath to him in my brother's office or whether he came into my office for that purpose. I do not recollect whether he was in my room on that day or not.

x-Q. 79. Mr. Liddell has testified that he was not given any opportunity to properly examine any papers or drawings anywhere in the establishment on that day, and that some papers were handed to him with the statement that they were his application papers, but those papers were not read to him and were not read by him, and that no facilities were offered to him for examining them, and that several people were conversing on other subjects in the room at the time, and that it was impossible for him under the circumstances to ascertain whether the papers were right or wrong, but that he was told or given to understand that they were right. He signed his name at the places where he was requested so to do, and took the oath that you administered to him, without really knowing the contents of the papers which were handed to him. Do you know anything to the contrary as above summarized in this question? Please to confine your statement to your knowledge by excluding therefrom all inferences based upon what would be proper or not proper, or customary or not customary; for, as you doubtless know, many well-meaning clients are known to swear

to affidavits which have been prepared by their attorney, upon the assumption that the affidavits were true, without taking pains to verify the work done by the attorneys in preparing the affidavits.

A. It is not my custom to permit a client or a witness to make an affidavit on any subject without fully verifying the statements and satisfying himself as to their accuracy. I do not know what your experience may have been. I had nothing to do with the matter of the Liddell applications on January 7, 1896, other than to administer the oath. What Mr. Liddell did in my brother's office before I was called to administer the oath is unknown to me. My recollection is that they were together for a considerable time. I do not know how they occupied that time. I know that if Mr. Liddell had desired to make any further examination of the applications after they were handed to me for the purpose of administering the oath, he could have done so to any extent he might have desired.

x-Q. 80. Mr. Liddell in his testimony manfully took to himself the blame for taking the oath before you without knowing the contents of the papers to which he understood himself to be swearing, and he took pains to exculpate you from all fault in connection with that matter, stating that he believed you acted in entire good faith and honestly in the whole affair. But he did testify that as a matter of fact he did not know the contents of the papers that were handed to him at the time he took the oath which accompanied those papers. Now I ask you whether you have any knowledge that Mr. Liddell did know the contents of those papers at that time?

A. I fail to appreciate Mr. Liddell's manfulness in taking to himself the blame for taking the oaths before me, as I have never heard it suggested until this moment that there was the slightest idea or suggestion that I had been guilty of any improper action in the administering of those oaths. If Mr. Liddell says that he did not have an opportunity to examine the applications properly and fully before he executed the oaths before me, he says what is not true. Whether he did examine them or not while he was in my brother's office and before he came to me, I do not know.

x-Q. 81. You do know, do you not, that he did not examine all those papers in your presence—and by examination, I mean reading them all through carefully?

A. I have no recollection whatever whether he did or did not.

x-Q. 82. Have you talked with your brother, R. M. Hunter, at any time since July, 1903, about the history of the Liddell application case, the oath in which application was administered by you to Mr. Liddell January 7, 1896?

A. At the time I was requested by Mr. Chambers to look up the Liddell application, I discussed the matter to a small extent with my brother, R. M. Hunter, but since that time we have never had any material discussion on the subject, As I understood it was the intention to call me as a witness, I deemed it inadvisable for me to discuss the subject with him after he had testified, and I have also avoided reading his testimony.

x-Q. 83. Mr. Betts, counsel for the complainant, as appears immediately before x-Q. 49 of this deposition, declined to consent to my asking Miss Kelly to inform me whether she did the typewriting of that specification of the Liddell Case A, which went to the Patent Office with the other application papers, but Mr. Betts stated that he would inform me after this deposition is closed, whether he will consent to Miss Kelly giving me that information. Now please to assume that after this deposition is closed Mr. Betts will decline to give that consent, and on that assumption please to state whether you will permit me nevertheless to visit your office and question Miss Kelly in your presence as to whether she did that typewriting, and also as to when she did that typewriting?

A. I have repeatedly stated that I have no objection to your asking Miss Kelly any questions at any time. It would seem to me that my consent is not necessary. I cannot prevent Miss Kelly from being a witness, if you see fit to call her, nor have I any desire to prevent her from being called.

x-Q. 84. I do not desire to trouble Miss Kelly with a subpœna, nor to trouble Mr. Betts to attend to the taking of a deposition from her, unless she remembers something definite about the history of the Liddell application of Case A; and therefore

I desire to be permitted, before calling her with a subpœna, to have an interview with her in your office, in the presence of whoever desires to be present, with a view of finding out beforehand whether she remembers any material fact in respect of the history of that application. Therefore I ask you whether I may come to your office, with or without the consent of Mr. Betts, and may interview Miss Kelly upon the subject to find out whether she remembers anything material to the matter.

[*Mr. Betts: This line of examination objected to as immaterial and not cross-examination of any kind, either proper or improper.*]

A. I have not the slightest objection.

x-Q. 85. Are you willing to give me a letter of introduction to Henry Drury, your former draughtsman, and another letter of introduction to William L. Evans, your former clerk, and another letter of introduction to Mr. Haverstick, your former client, or the client of your brother, as the case may be, and willing in those letters of introduction to state to those gentlemen that you have no objection to their giving me whatever information they possess relevant to the history of the Liddell application Case A?

[*Same objection.*]

A. As a matter of personal courtesy, I shall be pleased to give you letters of introduction to the persons you mention, but I do not think that I am called upon to aid you in securing testimony, and under the circumstances I think it would be highly improper for me to attempt to do so. I don't see that letters of introduction are necessary, and therefore, in view of the circumstances, I decline to give them.

x-Q. 86. I did not, in x-Q. 85, ask you to aid me in securing testimony, but only to waive whatever obligation of secrecy Mr. Drury, Mr. Evans or Mr. Haverstick might think rested upon them, and which obligations, if not waived, might cause those gentlemen to decline to give me any information. Thus, Mr. Drury, when asked for information, might be expected to say that his knowledge was obtained as incident to his employment by you, and Mr. Evans might say the same, and both of them

might decline to convey any information to me without your waiver of objection. So also Mr. Haverstick might say that the relation of client and attorney between him and you, in the matter of the Liddell application, was an obligation to his giving me any information about those applications in the absence of your statement to him that you had no objection to his doing so. In view of these suggestions I ask you to think again and state whether you will tell those three gentlemen that you have no objection to their giving me whatever information they possess relevant to the history of the Liddell application Case A?

[*Same objection, and also as improper to have the witness bind himself under the obligation of an oath as to what he will or will not do in a matter purely in the discretion and judgment of the witness, and which has no relation whatever to his actual testimony in this case, but to whether or not he will help Mr. Walker in looking into matters of evidence which Mr. Walker may desire to investigate.*]

[*Defendant's counsel states to the court that he claims that x-Q. 85 and x-Q. 86 are proper on cross-examination, because the answer will show whether the present witness is biased in favor of the complainant, it being obvious that he can have no objection to Mr. Drury, Mr. Evans or Mr. Haverstick telling to defendant's counsel whatever facts they may know upon the subject, other than whatever may be based upon a desire to prevent those facts from becoming known to defendant's counsel, and thus helping the defendant's defense while hurting the complainant's contention.*]

A. I have not the slightest objection to Mr. Drury or Mr. Evans or Mr. Haverstick testifying in this case, and I have no desire to influence them in any way whatever, and I do not propose to do so. Your request seems to me in the nature of an effort on my part to influence them in your favor. I do not propose to attempt to influence them in favor of either party, and I decline to meddle with the matter in any way.

x-Q. 87. Now, Mr. Hunter, you are an educated lawyer, and doubtless understand the law of privileged communication, and must realize that I can hardly expect to get any information

beforehand from Mr. Drury, Mr. Evans or Mr. Haverstick, unless you will waive all claims that their knowledge about the Liddell application Case A comes under the head of privileged communication, and you must also realize that if I subpœna those three gentleman, without knowing beforehand whether they know anything material or not, complainant's counsel may probably instruct them that it would be illegal for them to give any testimony upon the subject in the absence of a waiver from you of all objection to their doing so. For these reasons you must see that it will probably be possible for complainant's counsel to keep all the knowledge of Drury, Evans and Haverstick out of the record in this case, unless you will waive whatever objection you might base upon their knowledge being, or being claimed to be, entitled to immunity from disclosure under the law of privileged communication. With this explanation I ask you whether you are willing to waive that point and to permit those gentlemen to testify to whatever material facts they know, even if those facts should be decisive in favor of the defendant?

[*Complainant's counsel, without discussing the law on the subject as laid down by Mr. Walker, objects to any waiver by the witness of any legal rights inherent in complainant in this case, or any rights in connection with the taking of evidence.*]

A. I do not understand that the rule of privileged communication has any application to the persons you have mentioned, but if it has, it is their privilege, and I certainly see no reason why I should attempt to influence them either one way or the other. I do not propose to have anything whatever to do with the matter.

x-Q. 88. It seems to me that if the rule of privileged communication does apply to the persons I have mentioned, that that privilege cannot be waived by Drury or Evans unless it is waived by you, and that it should not be waived by Haverstick unless it is waived by you. Now please to assume that I am right on that point, and that the court will so hold, and on that assumption please to state whether you are willing to waive that privilege, so as to allow Drury, Evans and Haverstick to testify to the truth, the whole truth and nothing but the truth

which is known to them respectively in regard to the history of the application for the Liddell patent in suit, and which application you have designated as Liddell application Case A.

[*Same objection; also as calling upon the witness for a declaration which he is under no obligation whatever to make in answer to these questions or otherwise.*]

A. It seems to me that I have nothing to do with the question of the possible testimony of these witnesses, and I decline again to meddle with it. My own opinion as to whether or not they can take advantage of the rule of privileged communication, or how the privilege can be waived, has nothing to do with the subject, and I should think an attempt upon my part to pass upon these questions for the purpose of influencing possible witnesses would be grossly improper. I am only a witness in this case, and have no interest or favoritism.

x-Q. 89. I have no doubt that I can secure the testimony of all three of those witnesses, if you will waive whatever rights you have under the law of privileged communication in respect of the facts known to them, but I think it will be difficult and perhaps impossible to obtain any testimony by subpœna or otherwise from either of those witnesses unless you will waive whatever rights you have under the law of privileged communication to compel them to remain silent. Now with the issue thus clearly stated, I ask you whether you will or will not waive whatever right you have under the law of privileged communications in respect of whatever knowledge those witnesses have relevant to the Liddell application Case A?

A. I do not consider I have any right, and therefore I have nothing to waive. If it should be determined that I have any right under the rule of privileged communication, that must be waived to enable the witnesses mentioned to testify, I must leave the question of whether or not that right should be waived, to the witnesses. I positively decline now, as I have repeatedly before, to have anything to do with the matter, or to do anything which might be interpreted as an effort to influence these witnesses, and I should consider what you have asked me to do as manifestly having that effect, and it is only for this reason that I decline to give you the assistance you have asked for.

x-Q. 90. Will you waive whatever claim or privilege you have, be it much or little, and leave the witnesses to decide for themselves whether they will waive whatever privilege they may have?

A. I will not waive any claim or privilege that I may have until the question is directly raised in connection with the deposition of some particular witness. I will decide whether or not I will waive it, when the question is thus raised.

[*Cross-examination closed.*]

(Signed) ERNEST HOWARD HUNTER.

[Attest:]

Arthur Brenton Cook,
Notary Public.

UNITED STATES CIRCUIT COURT,

DISTRICT OF MAINE.

EASTERN PAPER BAG COMPANY

v.

CONTINENTAL PAPER BAG COMPANY.

[On Liddell Patent No. 558969.]

I, Miss R. M. Kelly, a notary public for the City and County of Philadelphia, in the State of Pennsylvania, duly authorized to administer oaths and take and certify depositions, do hereby certify:

That on March 11th and 12th, 1904, at the office of Ernest Howard Hunter, 926 Walnut street, Philadelphia, Pennsylvania, I was attended by the witness Ernest Howard Hunter, named in the foregoing deposition, Samuel R. Betts, counsel for complainant, and Albert H. Walker, counsel for defendant.

That said witness, Ernest Howard Hunter, who gave the foregoing deposition, being of sound mind, and of lawful age, was

by me, before giving said deposition, duly sworn to testify the truth, the whole truth, and nothing but the truth.

That that portion of the said deposition taken on the 11th and 12th days of March, 1904, was reduced to typewriting by me, in the presence of the said witness and counsel.

That said deposition was taken on said days, at the place aforesaid, pursuant to notice, hereto annexed, and the stipulation and agreement of the parties.

That the witness was material and necessary in the cause, and that he lives at a greater distance than 100 miles from the place of trial of the within entitled cause.

That at the end of the session of March 12, 1904, it was consented by counsel that the continuation of the said witness' deposition might proceed, in New York City, before some local notary public not objected to by either side, and that the continuation of the deposition, thus taken before the local notary, might be sent to me, and might be certified by me with the same effect as if I had taken the whole of the deposition personally, said consent appearing on typewritten page 42 of the foregoing deposition.

I, therefore, further certify that that portion of the foregoing typewritten deposition from page 43 to page 62, taken on the 16th day of March, 1904, at the office of Betts, Betts, Sheffield & Betts, 120 Broadway, New York City, in the presence of said counsel, before Arthur Brenton Cook, a local notary, was received by me from said notary as the continuation of the deposition of said witness taken in New York, pursuant to said consent, and in accordance therewith I hereby certify that portion of the said deposition with the same force and effect as if it had been taken before me personally.

That the portion of said deposition of said witness, taken at Philadelphia, as above stated, was taken down by me personally from statements made by him, and said witness, after reading over the whole of his said deposition, taken at Philadelphia, as above, subscribed the same at the end thereof.

In Witness Whereof, I have hereunto set my hand and affixed my seal, this 30th day of March, 1904.

(Signed.) R. M. KELLY,
Notary Public,
County of Philadelphia,
State of Pennsylvania,
Commission expires 7 Jan., 1907.

UNITED STATES CIRCUIT COURT,

DISTRICT OF MAINE.

EASTERN PAPER BAG COMPANY

v.

CONTINENTAL PAPER BAG COMPANY.

[Liddell Patent No. 558969.]

It is hereby consented, by and between the solicitors for the respective parties, that the foregoing deposition of Ernest Howard Hunter, taken herein in the City of Philadelphia on March 11th and 12th, 1904, before R. M. Kelly, a notary public, and in the City of New York on March 16, 1904, before A. B. Cook, a notary public, need not be sealed up and transmitted to the court by said notaries, but that said testimony may remain in the possession of the solicitors for the complainant, to be filed herein by them when all the testimony in the case has been taken.

Dated March 26, 1904.

BETTS, BETTS, SHEFFIELD & BETTS,
Complainant's Solicitors.

ALBERT H. WALKER,
Defendant's Solicitor.

UNITED STATES CIRCUIT COURT,

DISTRICT OF MAINE.

EASTERN PAPER BAG COMPANY,

vs.

CONTINENTAL PAPER BAG COMPANY.

Evidence taken on behalf of the complainant, at the office of Betts, Betts, Sheffield & Betts, 120 Broadway, Manhattan, New York, beginning on Saturday, June 18th, 1904, at 11 o'clock in the forenoon, and continuing thereafter by adjournment from time to time; the said evidence being taken before Arthur Brenton Cook, a Notary Public having authority to act as such in Manhattan, New York, and being taken down by Mrs. N. W. Pritchard, a typewriter operator, and being thus taken before said Cook by said typewriter operator, in pursuance of the stipulation of the parties, which is prefixed to the complainant's evidence, and which was made March 6th, 1902.

[*Met pursuant to notice.*]

Present—ARTHUR BRENTON COOK, the Notary Public, and SAMUEL R. BETTS, counsel for complainant, and ALBERT H. WALKER, counsel for the defendant.

[*Complainant's counsel refers to the testimony of the witness, Wilbur M. Stone, taken on the part of defendant herein on Monday, June 13th, 1904, and more particularly to XQs and answers Nos. 60, 61, 62, and complainant's counsel now offers in evidence the pointer referred to therein as a "new pointer" or "second pointer" or "another pointer" (in XQ60) and which was placed upon the model "Complainant's Exhibit Operative Model from Liddell Drawing No. 1," as stated in said XQ60. Said pointer is offered now on complainant's testimony herein because technically it is offered as one of complainant's exhibits and therefore could not strictly and technically be offered during defendant's case. Said pointer is marked herein*

as "Complainant's Exhibit New Pointer for Operative Model from Liddell Drawing No. 1, A. B. C., Exr., June 18th, 1904."]

[*Defendant's counsel objects to the introduction in evidence of the piece of metal which complainant's counsel marks as "Complainant's Exhibit New Pointer for Operative Model from Liddell Drawing No. 1" because the identity of that piece of metal with the pointer which was referred to by the witness Stone has not been proved in any way, and because the pointer shown to the witness Stone was not marked for identification at any time during the taking of the deposition of that witness, and that pointer was not committed to the custody of the notary at that time*]

SAMUEL R. BETTS, being duly sworn, deposes and says as follows:

I am of counsel for complainant herein. I was present at the taking of the testimony of Wilbur M. Stone on the part of defendant herein on Monday, June 13th, 1904, and asked that witness XQs Nos. 60, 61 and 62 of his deposition, and heard his answers thereto. The pointer I questioned the witness about in XQ60 and which was put on "Complainant's Exhibit Operative Model from Liddell Drawing No. 1" and which the witness Stone testified about in his evidence under the name of "second pointer" or "another pointer" is the same pointer which is now on that model at the present moment and the same pointer which I have just above offered in evidence as "Complainant's Exhibit New Pointer for Operative Model from Liddell Drawing No. 1." That model with that pointer thereon was left in the office of Mr. Walker, defendant's counsel herein, at the time of the closing of Mr. Stone's testimony and was thereafter sent down to my office and received by me under the arrangement between counsel that each counsel retain the custody of the exhibits on his side of the case except, of course, as necessarily in the custody of opposing counsel by request and consent and for the purposes of inspection and evidence. This model referred to was sent to Mr. Walker's office with my consent at his request, and was there for the purpose of the taking of defendant's testimony, specifically of the witness Stone, and on the understanding that Mr. Walker would return

the model to me when through with it, which he did, but with the signal change noted in having the new pointer thereon instead of the old pointer. This old pointer of the model, which was on it prior to the change set forth in XQ60 and which old pointer forms part of the model "Complainant's Exhibit Operative Model from Liddell Drawing No. 1" was at the taking of testimony on June 13th put by me in the custody of Mr. A. B. Cook, the notary, and thereafter handed by him to me personally and has been in my custody as a part of the model exhibit ever since. In accordance with my statement of June 13th made upon the record after XQ60 I now replace that old pointer on the model referred to in the presence of defendant's counsel, so as to put the model in exactly the same condition as it was prior to the asking of XQ60, and as the other pointer or new pointer referred to has been offered in evidence I have thus complied with my statement on the record.

[*Cross-examination by* MR. WALKER:]

x-Q. 1. It is true, is it not, that the pointer which was on the model when the model was offered in evidence by you, about six months ago, is a crooked piece of steel or iron, with a generally black surface and having its greatest width somewhat less than a quarter of an inch?

[*Objected to as the pointer itself, being part of the exhibit in this case, is the best evidence.*]

A. Your statement is substantially correct.

x-Q. 2. It is also true, is it not, that original pointer was replaced upon the model in its original position, immediately after you made your statement at the beginning of this deposition?

A. That is true.

x-Q. 3. It is true, is it not, that the pointer which you have offered in evidence to-day is a flat piece of bright steel having its greatest width nearly half an inch and being much thinner than the original pointer, which is now on the model?

[*Objected to as the pointer referred to, being an exhibit in the case, is the best evidence.*]

A. Your statement is substantially correct; a comparison of the two pointers shows exactly the difference between them.

x-Q. 4. Now, please to state who it was that made the pointer which you have offered in evidence to-day and state also when that pointer was made?

[*Objected to as not proper cross-examination.*]

A. I do not know.

x-Q. 5. When did you first see that pointer?

[*Same objection.*]

A. I do not remember.

x-Q. 6. Did you ever see that pointer prior to the day when you showed it to the witness Stone and when he answered your cross-questions 60, 61 and 62?

[*Same objections.*]

A. I did.

x-Q. 7. About how long prior to that day was the first occasion when you saw that pointer?

[*Same objections.*]

A. It is impossible for me to remember. It was some time before.

x-Q. 8. Why did you not put that pointer in evidence at the same time that you put in evidence "Complainant's Exhibit Operative Model from Liddell Drawing No. 1" in place of the pointer which you did put in evidence as part of that model about six months ago?

[*Same objections.*]

[*Complainant's counsel further states he does not consider himself technically obliged to answer this question.*]

A. It was not in existence at that time to the best of my knowledge and recollection.

x-Q. 9. Who made "Complainant's Exhibit Operative Model from Liddell Drawing No. 1," including the original pointer thereon?

[*Objected to as not proper cross-examination, not in any way called out by the direct nor cross-examination thereon, as a mere fishing excursion into matters within the knowledge of complainant's counsel in his capacity as counsel in this case and ascertained in such capacity.*]

[*Defendant's counsel calls the attention of the Court to the fact that complainant's counsel has put himself upon the stand as a witness on behalf of complainant to tell some things connected with "Complainant's Exhibit Operative Model from Liddell Drawing No. 1"; and that in so doing he has waived his right to keep secret any of his knowledge relevant to that model; and defendant's counsel submits to the Court that it is not lawful for counsel in a case to go on the stand in his own case and swear to points he thinks advantageous to his client and then decline to answer cross-questions relevant to the same subject on the ground that the facts called for by those cross-questions are privileged from disclosure by reason of his being counsel in the case.*]

[*Complainant's counsel states that his direct testimony was absolutely limited to proving identity of the new pointer offered in evidence to-day with the new pointer testified about by Mr. Stone on cross-examination and placed on the model in connection with XQ60; that the proposition enunciated by defendant's counsel that upon this direct testimony complainant's counsel can be cross-examined as to anything he knows about the case or anything he knows about the model, appears to complainant's counsel to be unsupported by the laws of evidence.*]

A. I did not see that model made nor any part of it made; it was first brought to my notice in a completed condition and I do not of my own knowledge know who actually did make it, if any one person did.

x-Q. 10. Who designed that model and in so designing it, laid out the contours and fixed the other characteristics of the two eccentric gears thereon and also of the cam of celluloid which works the arm?

[*Complainant's counsel makes the same objections and statement as after the last question x-Q. 9.*

A. As I consider you are going entirely outside any legitimate or proper cross-examination based on the direct or on the rules of evidence, merely trying to take advantage of my going on the witness stand to meet your very technical objection in connection with the offer of "Complainant's Exhibit New Pointer for Operative Model from Liddell Drawing No. 1" I consider myself justified in declining to further satisfy your curiosity or promote your fishing excursion and I therefore decline to answer the above question except under instruction of the Court so to do, to which instruction, however, if made, I shall promptly acquiesce as there is absolutely nothing to conceal about the matter, but I strongly object to waste of my time and my client's money and to defendant's taking evidence on their part during my time and under the guise of cross-examination.

x-Q. 11. It is true, is it not, that your last answer took more time and involved more expense to your client than would have resulted from your answering the question by telling the name of the man that made the model?

[*Objected to as immaterial and not proper cross.*]

A. For reasons above stated I decline to answer such a question.

x-Q. 12. Now, Mr. Betts, you have somehow procured "Complainant's Exhibit Operative Model from Liddell Drawing No. 1" in its original condition, and you put that model in evidence nearly six months ago when taking the deposition of Mr. Dayton; but Mr. Dayton would not admit, or at least did not admit during that deposition that he knew who it was that designed that model or who it was that made it; and until you went on the stand yourself to-day to testify to some facts relevant to that model you never took any testimony from anybody who admitted or said that he knew its origin. Now, the origin of that model is material to the case and that origin is logically a part of the complainant's case. For these reasons I must insist upon receiving your testimony in full response to x-Q. 10. Please, therefore, to answer that question.

[*Complainant's counsel makes the same objection and same statement as after x-Q. 9, adding thereto the statement that it was incumbent upon defendant to take such proof as they desired about said model during defendant's own time, which has now expired. Adding also the further statement that the evidence to be taken during complainant's present time is limited to evidence on the part of complainant and defined by definite stipulation of April 29th, 1904, under which the evidence sought to be brought out by this line of cross-question does not come.*]

A. For reasons and objections hereinabove set forth I decline to answer this question or any other questions on the same exact line until the matter is submitted to the Court and I am instructed that it is proper for me to answer them.

SAM'L. R. BETTS.

Subscribed and sworn to before me this 18th day of June, 1904.

Arthur Brenton Cook,
Notary Public.

Clerk's Certificate.

UNITED STATES OF AMERICA, *District of Maine, ss:*

I, James E. Hewey, Clerk of the Circuit Court of the United States for the District of Maine, hereby certify that the seven volumes, entitled as follows:

Volume I., Complainant's Record, Prima Facie Proofs;
Volume II., Complainant's Record, Answering Proofs;
Volume III., Complainant's Record, Exhibit Book;
Volume IV., Defendant's Record, Continental Record, Volume I., Answer and Evidence;
Volume V., Defendant's Record, Continental Record, Volume II., U. S. Patents;
Volume VI., Defendant's Record, Continental Record, Volume III., Exhibits;
Volume VII., Proceedings in Circuit Court;

this certificate being attached to each of said volumes, contain and are a true copy of the record and all proceedings of said Circuit Court in the cause in equity entitled,

No. 546.

EASTERN PAPER BAG COMPANY, Complainant,
v.
CONTINENTAL PAPER BAG COMPANY, Defendant,

in said Circuit Court determined, the Petition for Appeal, Assignment of Errors, Supersedeas Bond on Appeal, Bond on Appeal, Opinion of the Circuit Court, and also the original Citation with acknowledgment of service thereon.

Witness my hand and the seal of said Circuit Court this thirty-first day of January, A. D. 1906.

[SEAL.] JAMES E. HEWEY, *Clerk.*

Circuit Court of the United States

DISTRICT OF MAINE.

IN EQUITY.

EASTERN PAPER BAG COMPANY,

Complainant,

vs.

CONTINENTAL PAPER BAG COMPANY,

Defendant.

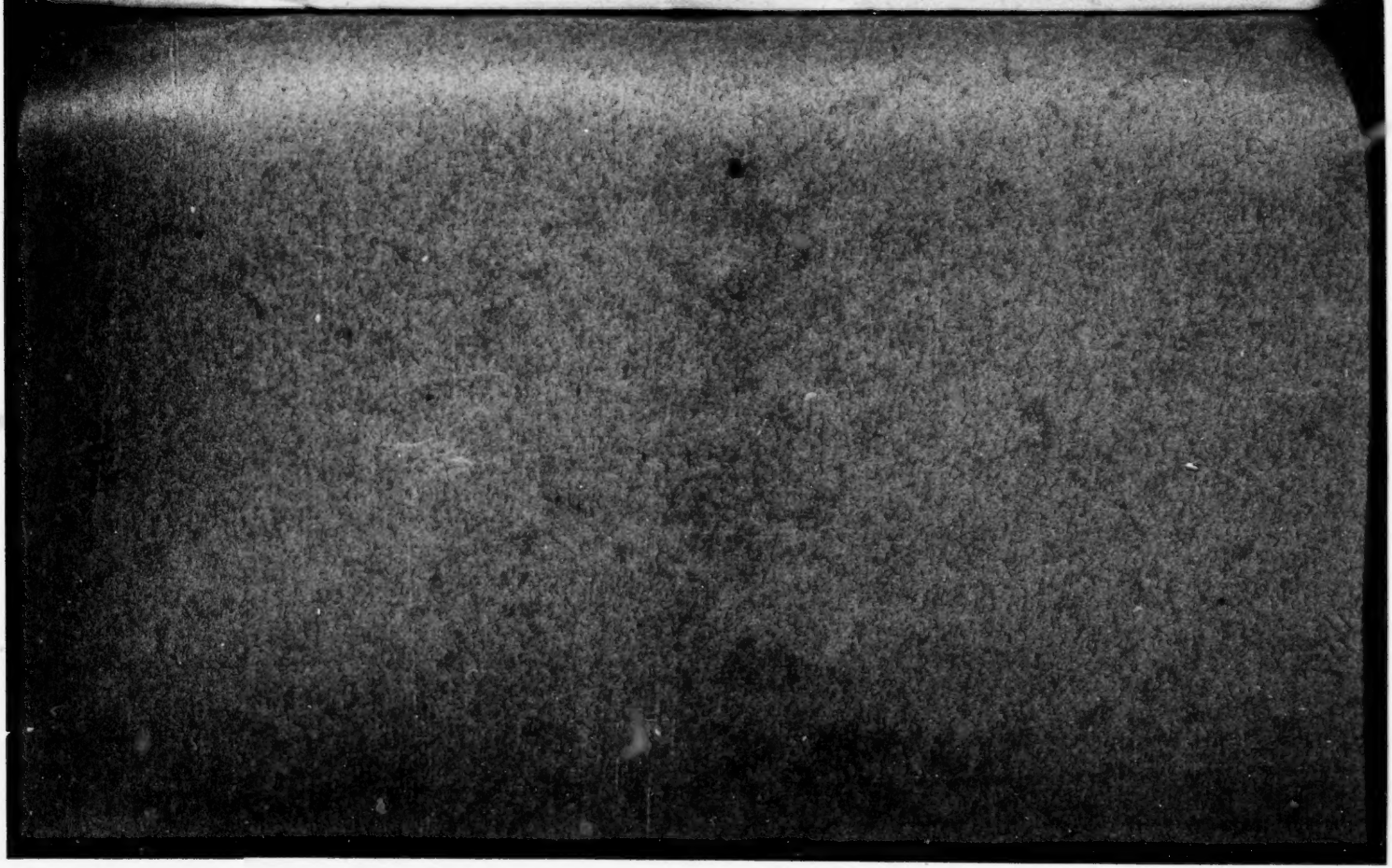
ON LETTERS PATENT NO. 534,[illegible].

VOLUME III.

COMPLAINANT'S RECORD.

EXHIBIT BOOK.

Betts, Betts, Sheffield & Betts,
Solicitors for Complainant,
120 Broadway,
New York City.



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U. S. Circuit Court, Dist. of Maine.

Eastern Paper Bag Co.

—vs—

Continental Paper Bag Co.

—oo—

U. S. Circuit Court, Dist. of Conn.

Eastern Paper Bag Co.

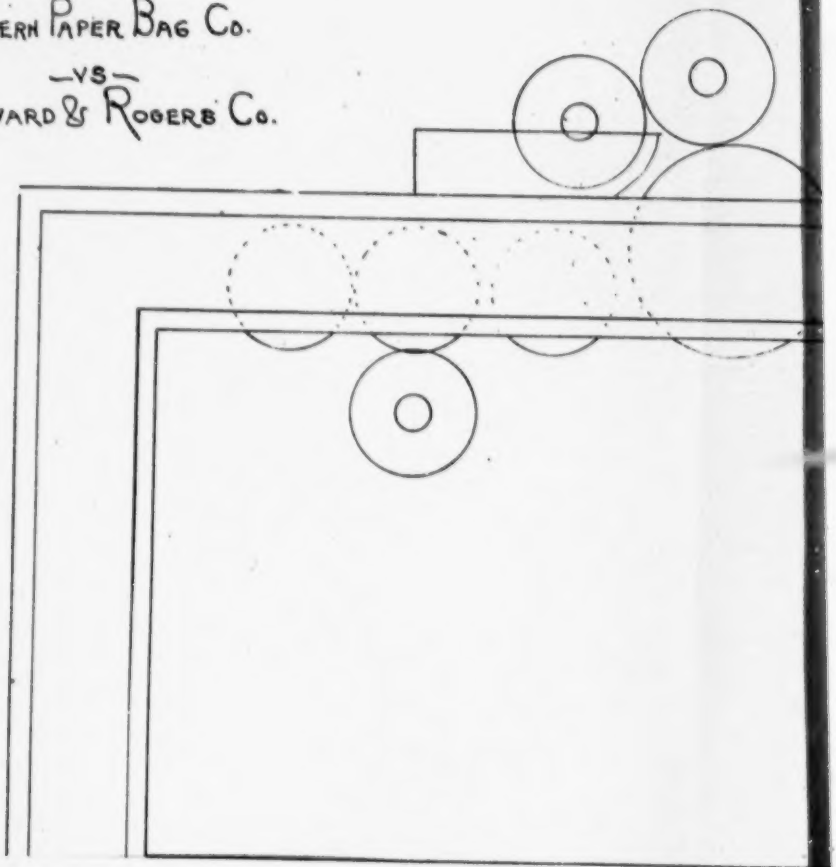
—vs—

Woodward & Rogers Co.

COMPLAINANT'S EXH

LIDDELL · ORIGINAL SK

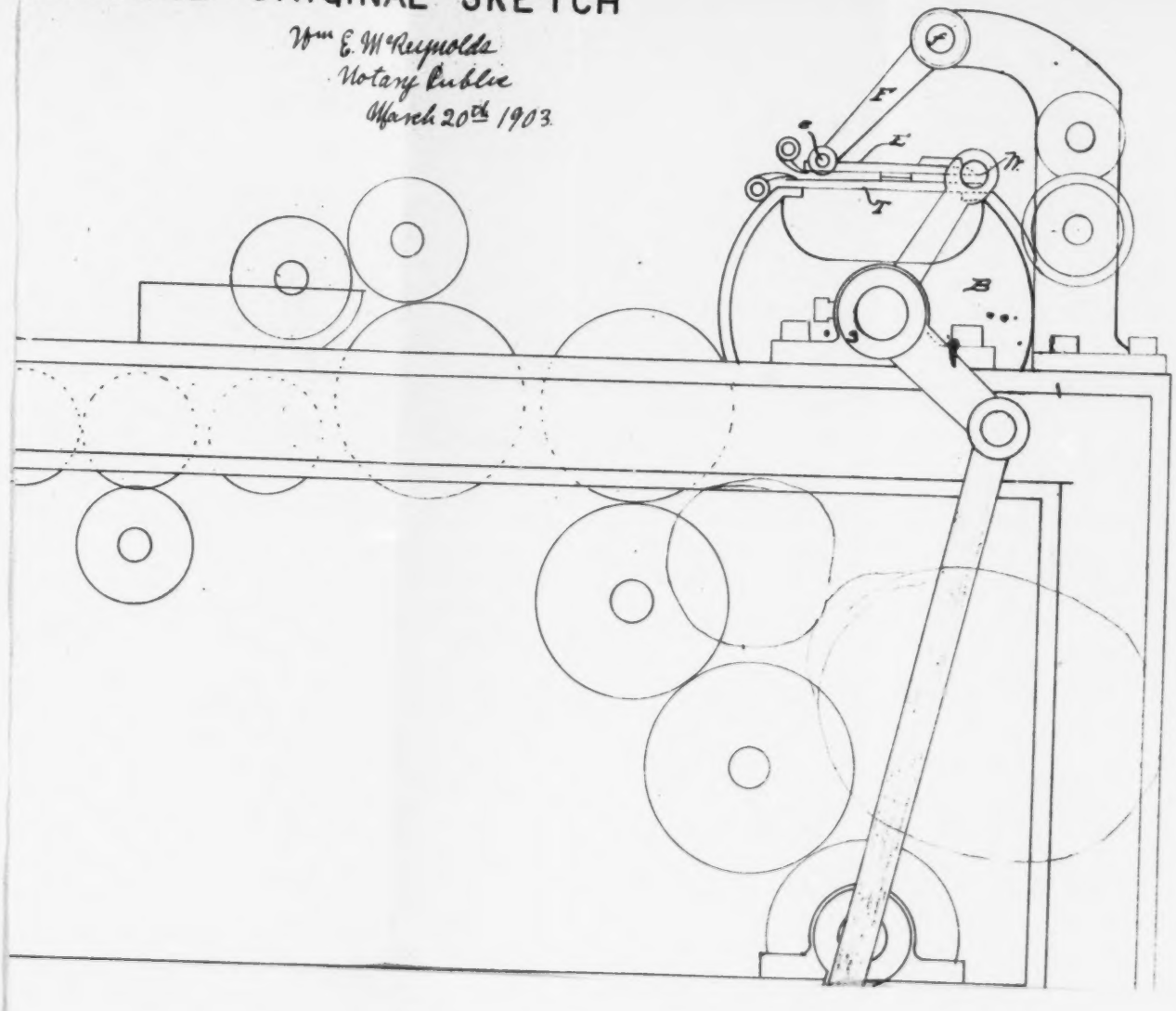
Wm E. McReynolds
Notary Public
March 20th



COMPLAINANT'S EXHIBIT

LIDDELL - ORIGINAL SKETCH

Wm E. McReynolds
Notary Public
March 20th 1903



1888 UNITED STATES CIRCUIT COURT,

DISTRICT OF MAINE.

EASTERN PAPER BAG COMPANY

vs.

CONTINENTAL PAPER BAG COMPANY.

COMPLAINANT'S EXHIBIT,
LIDDELL CONTRACT
of Jan. 12, 1893.

1889

Wm. E. McReynolds,
Notary Public.

UNITED STATES CIRCUIT COURT,

DISTRICT OF CONNECTICUT.

EASTERN PAPER BAG COMPANY

vs.

WOODWARD & ROGERS COMPANY.

1890

COMPLAINANT'S EXHIBIT,
LIDDELL CONTRACT
of Jan. 12, 1893.

Wm. E. McReynolds,
Notary Public.

Agreement.

1891

This agreement, made this 12th day of January, A.D. 1893, by and between William Liddell, of Brooklyn, New York, party of the first part, and the Eastern Paper Bag Company, a corporation duly organized under the laws of Connecticut, party of the second part, witnesseth:

That whereas, said company is owner of a machine for making so-called "self-opening bags" embodying certain inventions by William B. Purvis, patented in and by three letters patent and a pending application all assigned to said Company;

And whereas, it is desired by said Company that certain additions and improvements shall be made to and in said machines and said Liddell is willing to undertake to make such additions and improvements, with the understanding that all 1892
inventions and improvements which may be made by said Liddell shall be the property of said Company;

Now, therefore, in consideration of the sum of One dollar, and other good and sufficient considerations to said Liddell paid, the receipt whereof is hereby acknowledged, said Liddell hereby assigns, and agrees to assign, to said Company all inventions and improvements which he may make in such machine, and all inventions in any way relating or pertaining to machines for making so-called self-opening bags, which he may make during his employment by said Company, or within six months after the end of said employment; and agrees that upon making any such inventions he will forthwith disclose the same to said Company, and will make application for patents upon 1893
such inventions, in such form as shall be deemed proper by said Company or its legal advisers and will assign to said Company by proper assignments, said several inventions and the applications filed therefor, and any and all Letters Patent which shall be granted for said inventions, or upon said applications, and will request the Commissioner of Patents to issue any patents that may be granted on such applications to said Company, as assignee of said Liddell, and will testify in any interference suits relating to any such applications or patents

granted thereon, and will in every way do all in his power to aid in procuring patents upon such applications.

Said Liddell further agrees that any inventions made by him after the period hereinbefore named, which do not belong to said Company under this contract, shall forthwith be fully disclosed by him to said Company and shall be disposed of to said Company, if satisfactory terms can be agreed upon; and that such inventions shall not be disclosed or offered to any other parties whatever until said Company shall have had full opportunity to acquire the same.

In witness whereof the parties have hereunto set their hands and seals the day and year first above written.

Wm. Liddell. [SEAL.]

The Eastern Paper Bag Co.,
by
C. O. Stearns, Treas. [SEAL.]

UNITED STATES CIRCUIT COURT,

DISTRICT OF MAINE.

EASTERN PAPER BAG COMPANY

vs.

CONTINENTAL PAPER BAG COMPANY.

COMPLAINANT'S EXHIBIT,
LIDDELL CONTRACT
Oct. 5, 1894.
Wm. E. McReynolds,
Notary Public.

UNITED STATES CIRCUIT COURT,

DISTRICT OF CONNECTICUT.

EASTERN PAPER BAG COMPANY

vs.

WOODWARD & ROGERS COMPANY.

COMPLAINANT'S EXHIBIT,
LIDDELL CONTRACT
of Oct. 5, 1894.

Wm. E. McReynolds,
Notary Public.

1900 This agreement made this 5th day of October, 1894, by and between the Eastern Paper Bag Company, a corporation duly established under the laws of the State of Connecticut, hereinafter called said Company, and William Liddell, of Brooklyn, New York, witnesseth:

That whereas, said Company is the owner of patents for the manufacture of paper bags, and at the present time is desirous of developing and perfecting the best possible machine for the manufacture of that form of paper bag known as the self-opening satchel bottom bag; and

Whereas, said Company has now at Bridgeport, Pa., one type of machine in operation, which is not yet a practical machine, although the principles of its operation seem promising,
1901 and it is believed that by proper mechanical skill it can be developed into a practical, operative machine, and said Company further may desire to work out and develop other types of machines for making such bags; and

Whereas, the said Liddell is an inventor and skilled mechanic, having had special experience in the manufacture of paper bag machines, and having worked for a long time on said machines now in Bridgeport; and

Whereas, said Company desires to employ said Liddell as an inventor and skilled mechanic for the purposes aforesaid, on the terms hereinafter set forth,

Now, said Liddell in consideration of the agreements of said Company hereinafter contained, hereby enters the employ
1902 of said Company as an inventor and skilled mechanic, and covenants and agrees that he will serve said Company in that capacity for the term of one year from and after the 15th day of October, 1894.

The said Liddell covenants and agrees that during the term of his said employment he will use all reasonable efforts to promote the business of said Company generally, and in particular to perfect said type of machine now in Bridgeport, so that it will be a practical and successful machine for the manufacture of self-opening satchel bottom bags; and will, if requ[illegible] so to do, attempt to invent, devise and build other types of machines for the manufacture of such bags, giving to

said Company in his said capacity the full benefit of his in- 1903
ventive and mechanical skill, with the view of making such types of machines as perfect and as commercially successful as possible.

Said Liddell agrees that if requested so to do by said Company, he will work in accordance with the ideas of other persons; or if requested so to do, will work in accordance with his own ideas.

For the consideration aforesaid, said Liddell covenants and agrees forthwith to assign to said Company by valid assignment, any and all patents which he now owns or controls, which may be useful in the manufacture of self-opening satchel bottom bags, or in the operation of machines for that purpose, without any further consideration than that named in this 1904
contract. Said Liddell recollects at present one patent belonging to him which may be useful for the purpose aforesaid, which is to be so assigned.

Said Liddell further covenants and agrees forthwith to disclose to said Company any inventions that he has made prior to the date hereof relating to self-opening satchel bottom bags, or to machinery or processes for the manufacture of the same; and that if at any time during the term of his employment, or during the period of six months after he shall have left the employ of said Company, he shall make any inventions or conceive any ideas as to inventions useful for the manufacture of self-opening satchel bottom bags, or relating to machinery or processes for the manufacture of the same, he will forthwith 1905
disclose the same to said Company; and that he will at any time at the request of said Company apply for letters patent for any of said inventions made by him, and assign said applications and inventions and any letters patent that shall be granted on said applications to said Company, requesting the Commissioner of Patents to issue such patents to said Company as his assignee, without other and further consideration than that named in this contract. It being the intent herein that said Company shall not only have the full benefit of all the inventive and mechanical skill of the said Liddell during the term of his employment by said Company, but that it shall also own abso-

1906 lutely all inventions relating to the manufacture of self-opening satchel bottom bags or machinery or processes therefor that he has made prior to the date hereof, or shall make during the term of his said contract, or within six months thereafter.

In consideration of the agreements of said Liddell herein contained, said Company covenants and agrees that for and during the term of his employment by it, it will pay him in full consideration for his services and inventions, and for this contract, the sum of Two thousand five hundred ($2,500.00) dollars a year, payable monthly at the end of each and every month; the first payment to be made the 15th day of November, 1894.

It is understood and agreed that if said Company desires
1907 so to do, it may extend the term of the employment of said Liddell and this contract for one year in addition to that hereinbefore specifically named, namely, from the 15th day of October, 1895, to the 15th day of October, 1896, by giving said Liddell notice in writing not less than thirty days before the 15th day of October, 1895, that it so desires to extend his term of employment and this contract. If such notice is given, all the terms and conditions of this contract shall continue for said additional year. and so many thereof as relate to inventions of the said Liddell made within six months after the term of his employment ceases, shall continue and be in full force for the six months after the expiration of said second year, if his employment continues for such
1908 second year.

In witness whereof, said Company has caused these presents to be duly executed, and said Liddell has hereunto set his hand and seal the day and year first above mentioned.

The Eastern Paper Bag Co.,
by
C. O. Stearns, Treas. [SEAL.]

Wm. Liddell. [SEAL.]

UNITED STATES CIRCUIT COURT,
DISTRICT OF MAINE.

EASTERN PAPER BAG COMPANY
vs.
CONTINENTAL PAPER BAG COMPANY.

COMPLAINANT'S EXHIBIT,
WALKER-LIDDELL LETTER
of February 26, 1903.
Wm. E. McReynolds,
Notary Public.

UNITED STATES CIRCUIT COURT,
DISTRICT OF MAINE.

EASTERN PAPER BAG COMPANY
vs.
WOODWARD & ROGERS COMPANY.

COMPLAINANT'S EXHIBIT,
WALKER-LIDDELL LETTER.
of February 26, 1903.
Wm. E. McReynolds,
Notary Public.

Albert H. Walker,
Counselor at Law.
Floor 25 Park Row Building, Manhattan, New York.
Thursday, February 26, 1903.

William Liddell,
401 10th St.,
Brooklyn, N. Y.

Dear Sir:—

1912 case of the Eastern Paper Bag Company, vs. the Continental Paper Bag Company; I shall present to the United States Circuit Court, in Portland, Maine, on Monday next, a motion to be permitted to take depositions in that case, to prove the same facts that are stated in that affidavit; and I expect that that motion will be granted. In that event, I shall proceed soon thereafter to take those depositions; beginning with one from yourself, and probably beginning in my office, on Wednesday, March 4, 1903, at 11 o'clock in the forenoon. I write to notify you of this programme, and to ask you to arrange your business to reach my office at that time, and be ready to devote as many days as may be necessary, to the answering of such questions as may be put to you by counsel on both sides, in
1913 order to regularly record in that deposition, your knowledge and recollection of the facts inquired of.

The direct-examination will be conducted by me, and will consist in putting such questions to you, as will enable you to state in answer thereto, the same facts that are stated in your affidavit of February 2, 1903. The cross-examination will probably be conducted by Mr. Samuel R. Betts; and I think I can judge about what classes of questions he will put to you; and I venture to state what I think they will be; in order that you may refresh your recollection beforehand, and be able to promptly, clearly, and fully answer his questions, as well as my own. If I am right in my judgment, upon the subject, Mr. Betts will put to you the following classes of questions:

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1. A class of questions intended to develop *when* it was that you planned, the two separate machines for making paper bags, which you explained to Mr. Hunter's draftsman, some time *before* you went to Philadelphia, on or about January 7, 1896, and executed the application papers which Mr. Hunter showed to you, at that visit.

2. A class of questions intended to weaken, qualify, or change your testimony; that you did not yourself plan the cam K, the rod k, the link k', and the arm connecting the left-hand end of that link, and the gear M', of the Liddell patent, No. 558,969, of April 28, 1896; and *never* planned *any* mechanism for

making the plate E, of that patent to oscillate forward and back under the shaft e; and *never* intended, or expected, or planned to produce any such oscillation at all. 1915

3. A class of questions intended to weaken or change your testimony that Liddell Drawing No. 1, which is attached to your affidavit of February 2, 1903, shows *the* plan, which corresponds nearer than any other produced by you, to what is shown in the drawings of the patent, No. 558,969, of April 28, 1896.

4. A class of questions relating to conversations claimed by Mr. Betts, to have occurred between him and you, or between you and Mr. Coburn, or between you and Mr. Ward, or between you and some other party or parties, connected with the Eastern Paper Bag Company, or with the Union Bag & Paper Company; and which conversations may be claimed by Mr. Betts to have included statements made by you, inconsistent with your testimony in your affidavit of February 2, 1903. 1916

5. A class of questions put to you for the purpose of informing the court, whether you were bribed by some direct or indirect means, to make your affidavit of February 2, 1903, or to previously give me the information set forth in that affidavit, or to subsequently give a deposition to the same effect.

6. A class of questions intended to make known to the court, whether you expect to be paid any money, or other thing of value, for any testimony you have given or may give for the Continental Paper Bag Company; and if so, whether you expect to be paid only the legal fee of one dollar and a half per day, for an ordinary witness; or whether you expect to be paid at the same rate per day, that you would be earning for yourself, if not called upon to devote time to testimony for the Continental Paper Bag Company; or whether you expect to be paid some *large* sum of money, having some supposed relation to the supposed *value of your testimony* to the Continental Paper Bag Company. 1917

7. A class of questions intended to develop and present to the court, the fact and the language of your contract of Decem-

1918 ber 29, 1902, with the Continental Paper Bag Company; and also to develop the truth, as to whether the language of that contract represents the real bargain which was made between the Continental Paper Bag Company and yourself, at or about that time.

8. A class of questions intended to develop and secure your opinion of the comparative construction, mode of operation, and merits, of the mechanism shown in the Liddell patent, No. 558,969, of April 28, 1896, on the one hand; and the mechanism shown in the Liddell Drawing, No. 1, on the other hand.

9. A class of questions intended to ascertain what, and how much, you remember of what was said and done in detail, by
1919 or between Mr. Hunter or Mr. Hunter's draftsman, and yourself, when you *first* presented to one or both of them, your partly worked-out plans for two paper bag machines; and also what was said or done by or between you and Mr. Hunter, when you visited him in Philadelphia on or about January 7, 1896, and executed the two sets of application papers which he presented to you, at that time.

10. A class of questions relating to your work for the Eastern Paper Bag Company in 1894 and 1895, reconstructing the Purvis machine.

11. A class of questions inquiring how you fixed the date of January 7, 1896, as being the time, on or about which, you
1920 went to Philadelphia, and called upon Mr. Hunter, and executed the two applications, which he presented to you.

12. A class of questions relating to what you may have said or omitted to say, to any person, relevant to the Liddell patent, No. 558,969, of April 28, 1896, soon after you saw in the Scientific American, that that patent had been granted in your name.

13. A class of questions relevant to all that was said between you and me, or between you and Mr. King, at the interviews which occurred between us, and between you and him, within the two weeks preceding your affidavit of February 2, 1903.

I have thus taken pains to specify and describe what classes 1921
of questions I expect Mr. Betts to put to you on your cross-examination; and you know that it will be your duty to answer his questions as fully, frankly, and carefully, as you will answer my questions. Unfortunately, as I think, for yourself, you occupy a position between the conflicting parties, in this litigation, which makes your testimony important, in one way or the other, to each of those parties. If it turns out that your deposition, when completed, is more unfavorable to one party than to the other, that party will regret that fact; and "the bringer of unwelcome news hath but a losing office, and his tongue sounds ever after as a sullen bell." But neither party can *justly* complain of you, for answering, one after the other, all the questions that are put to you, by counsel on either side, 1922
in strict accordance with the facts, to which those questions respectively relate. And you may well disregard all danger of *unjust* complaint, on account of any such answer or answers. In order that justice may be administered in court, it is necessary to call upon citizens, some times to act as witnesses, and some times to act as jurors; and every citizen is bound to act faithfully in either capacity, when properly called upon so to do; no matter how much he would prefer to escape the duty. Such is your position in the present case. To discharge your duty in this case, you have only to take and hold the witness-chair, with a determination to testify to the best of your knowledge and recollection, in response to every question put to you, without regard to what effect your answer may have upon any 1923
person or party. Taking and holding that impartial attitude, you will retain the respect of your friends, and secure the approval of the court; and can properly disregard, however much you may regret, any disappointment which one party or the other to the litigation, may suffer from the facts testified to by you.

Yours truly,

Albert H. Walker.

U. S. CIRCUIT COURT, DISTRICT OF MAINE.
EASTERN PAPER BAG CO.
v.
CONTINENTAL PAPER BAG CO.
COMPLAINANT'S EXHIBIT "HUNTER FILE CASE A",
July 23, 1903, J. A. S., Special Examiner.

642

Patent No.
558,969.

William Liddell No. 578291 Filed Feb. 6. 1896 Case A.

INVENTION Paper Bag Machines.

Rejection Mar. 1. 1896.
Amended
Rejection
Amended
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APPEALS

TO THE BOARD OF EXAMINERS.

Taken Hearing
Decision

TO THE COMMISSIONER.

Taken Hearing
Decision

INTERLOCUTORY.

Taken Hearing
Decision

REMARKS

INTERFERENCE.

ALLOWED Mch. 17. 1896.

PATENTED

No. 558,969 Date Apr. 28. 1896 Received Apr. 29. 1896.

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(2—020.)

Issue Division.
All communications should be addressed to "The Commissioner of Patents, Washington, D. C."

DEPARTMENT OF THE INTERIOR,

U. S. Patent Office,

Washington, D. C., April 3, 1886

William Liddell
& R M Hunter
926 Walnut St
Phila
Pa

SIR:

You are informed that the final fee of TWENTY DOLLARS has been received in your application for Improvement in

Paper Bag Machine

578291

Very respectfully,

Thos. Ewing
Commissioner of Patents.

9491:20m

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(2–024.) Serial No. 578291

Issue Division.
All communications should be addressed to "The Commissioner of Patents, Washington, D. C."

DEPARTMENT OF THE INTERIOR,

U. S. Patent Office,

Washington, D. C., March 17, 1896

William Liddell
4. R. M. Hunter
926 Walnut st
Phila. Pa.

SIR:—Your APPLICATION for a patent on an IMPROVEMENT IN

Paper Bag Machines

Filed Feb 6 1896, has been examined and ALLOWED.

The final fee, Twenty Dollars, must be paid, and the Letters Patent bear date as of a day not later than SIX MONTHS from the time of this present notice of allowance.

If the final fee is not paid within that period the patent will be withheld, and your only relief will be by a renewal of the application, with additional fees, under the provisions of Section 4897, Revised Statutes. The Office aims to deliver patents upon the day of their date, and on which their term begins to run; but to do this properly applicants will be expected to pay their final fees at least TWENTY DAYS prior to the conclusion of the six months allowed them by law. The printing, photolithographing, and engrossing of the several patent parts preparatory to final signing and sealing, will consume the intervening time, and such work will not be done until after payment of the necessary fees.

When you send the final fee you will also send, DISTINCTLY AND PLAINLY WRITTEN, the name of the INVENTOR and TITLE OF INVENTION AS ABOVE GIVEN, DATE OF ALLOWANCE (which is the date of this circular), DATE OF FILING, and, if assigned, the NAMES OF THE ASSIGNEES.

If you desire to have the patent issue to ASSIGNEES, an assignment containing a REQUEST to that effect, together with the FEE for recording the same, must be filed in this Office on or before the date of payment of final fee.

Additional copies of Specifications and Drawings will be charged for at the following rates: Single Copies, uncertified, 10 cents each. The money should accompany the order.

Very respectfully,

John S. Seymour

Commissioner of Patents.

The within title is that given by the Examiner in charge, as most appropriate to your invention. Should you desire a change in the same, satisfactory reasons MUST be given therefor on or before the payment of the final fee.

PLEASE REFER IN LETTER TO THE SERIAL NUMBER AT THE HEAD OF THIS OFFICE

After allowance, and prior to payment of the final fee, applicants should carefully scrutinize the description to see that their statements and language are correct, as mistakes not incurred through the fault of the office, and not affording legal grounds for reissues, will not be corrected after the delivery of the letters patent to the patentee or his agent.

My invention has reference to paper bag machines, and consists of certain improvements which are fully described in the following specification and are shown in the accompanying drawings which form a part thereof.

This application comprehends certain mechanism for forming a satchel bottom upon the tube in the manufacture of paper bags, and has for its object the production of a perfectly formed satchel bottom bag in a speedy and accurate manner. My improvements briefly stated may be described as follows:-

The tube is received upon a revolving cylinder and carried forward by a nipper which clamps the lower sheet of the tube, or by other means hereinafter described. The upper sheet of the tube passes above a finger upon a movable forming plate securely held at a short distance from the revolving cylinder and between which and the cylinder the tube is guided. The forming plate is then caused to rotate about its rear edge simultaneously with its movement or travel with the revolving cylinder, thereby opening the end of the tube, spreading the side folds and marking a creased line transversely. Simultaneously with this, forming fingers are projected into the side folds, one pair being adapted to the cylinder and the other pair to the forming plate. A continued movement of the parts cause the upper layer or sheet of the tube to be completely turned backward upon itself, and at the same time the forming fingers together with the other parts insure the proper formation of the diamond fold. The tube in this shape leaves the revolving cylinder, passes to the pasting devices and thence to the folder.

The invention will be better understood by reference the accompanying drawings in which:-

surface of the cylinder during the rotary movement of said

Fig. I is a side elevation of a paper bag machine embodying my improvements.

Fig. 2 is a plan view of a portion of the same.

Figs. 3 and 4 are sectional elevations on the line x x of Fig. 2 showing the operations of the parts in the formation of the bottom.

Figs. 5, 6, 7 and 8 are perspective views illustrating the several manipulations which take place upon the bag tube in its formation under the action of the nipper and the forming fingers.

Fig. 9 is a diagram illustrating the employment of a continuous or connected serie of tubes to insure their being fed with the cylinder and obviating the necessity of nippers.

Fig. 10 is a plan view of the paper tube employed in connection with Fig. 9.

Fig. 11 is an inverted plan view of same; and

Fig. 12 is a longitudinal section of the tube on line z z.

A is the main frame of the machine.

B is a shaft carried upon the main frame and upon which is supported the forming cylinder C which may be provided with one or more nippers c adapted to be closed and held closed by the action of the spring c', and opened by the section of a pin C^2 acting upon the star wheel C'. The nipper is also controlled as to its being closed by the action of the pin C^3 also acting upon the star wheel. These devices operate to enable the nipper to close upon the forward edge of the under layer of the bag tube, and after the formation or creasing of the bottom into the diamond folds, to release the bag tube.

D D are two feed or guide rollers adapted to properly deliver the bag to the cylinder C.

E is a forming plate and is hinged at e to the arm F journalled to the main frame at f. This arm F is drawn toward the cylinder C by a spring E' and is moved away from the cylinder about the axis f by cam K' and arm F'.

L is a rotating power shaft carrying cam and is driven by a belt pulley L' and operates the cylinder C by gears M^2 M^3. Spur gears M' M N operate the axis e of the forming plate E when the arm F is moved. Of these gears M' is substantially fixed, and hence when the arm F is moved, its gears M work upon the gear M' as if it were a rack. This causes motion to the plate E about e as an axis.

As the motion of the arm F is irregular and not always in the same direction for one continuous movement of the former plate E, I cause the gear M' to be moved somewhat to compensate for this. On the shaft J I arrange a cam K which acts upon a rod k to reciprocate it, and this by link k^3 rocks the gear or rack M'. The cams K and K' insure a proper return movement of the arm F and former plate E, and in time with the rotations of the cylinder C. In place of these devices for controlling the movement of the plate E relatively to the cylinder C, the said plate may be moved or operated by any other suitable means. The return movement of the plate E is unimportant, so long as it is secured in time to receive a new bag tube or section thereof.

The cylinder C has pivoted upon its periphery fingers G G which are normally out of the line of the bag tube, but which may be projected inwardly by the action of a cam I' secured to the main frame A. The fingers G G are connected together by arms g and a link G' arranged in the under side of

the cylinder surface, and one of them is further provided with an arm G^2 adapted to come in contact with the cam I' during the rotation of the cylinder and thus cause cause said fingers to be projected inward as indicated in dotted lines in Fig. 2 so as to enter the bellows side folds of the tube. The former plate E has its rear edge made sharp as at W so that when it presses downward upon the bag tube it forms a transverse crease about which the paper bends as clearly shown in Figs. 4 and 6. This former plate E is also provided with fingers H H corresponding to the fingers G G which are connected by arms h and link H' precisely as are connected to the fingers G G, and are operated by means of a spring J in one direction to hold them out of action, and a stationary cam I acting upon an arm or projection H^2 to move them inward or in the other direction so that they enter the bellows side folds precisely as at the fingers G G. Stops J' limit their movement in one direction.

The rear or free end of the former plate E is provided with eyes E^2 which are received upon projections A', as clearly shown in Fig. 3 so as to be maintained out of the line of the bag tube in entering between the said plate and the cylinder C after it has been caught by the nipper c and moved forward. When the bag tube is moved to the position shown in Fig. 3, the upper layer of the paper is moved over a finger E' arranged adjacent to the axis c and below the former plate E. As the plate E is moved forward with the bag tube, the eye E^2 leaves the projection A', as shown in Fig. 4, and the edge W presses down upon the paper forming a line or crease. It will also be observed that as this takes place the fingers G,H, upon each side of their free ends are brought more or less to-

gether and at the same time the finger E' moves away from the nipper c, opening the bellows side folds as indicated in Fig. 4. This permits the ready entrance of the fingers G H under the action of the cams I', I, and these fingers continue to maintain their position during the successive formative actions of the machine. As the cylinder C moves forward, the plate E rotates upon its own axis c and also about edge W as an axis as indicated in Figs. 6, 7 and 8, which action is so timed that the several fingers G, H, nippers g and finger E' operate to form the several actions upon the tube substantially in the manner as indicated in Figs. 2 to 8. As this folding action is completed, the fingers G, H quickly fly out of the folds of the tubes when their arms G^2 H^2 lift the cams I' I, and the bag in its folded condition is still held by the nipper c and carried forward with the cylinder C. It is then delivered to the rolls S, having pins s, thence to the paste rolls Q, T, of which Q applies the paste after having received it from the rolls P, P, and vat O. The bottom is then folded by the knife F which folds the paper upon itself between pressure rolls R, R. It is quite evident that the delivery, paste and subsequent folding devices may be made in any of the well known manners, and their particular construction is immaterial to my invention. I do not, therefore, deem it necessary to describe the minute details of these devices, but illustrate them as to show their relative position in a machine of the class described.

When the cylinder C advances sufficiently to deliver the bag to the feed rolls S, the star wheel reaches the pin C^2 and opens the nipper c to relpase the paper bag, and the said nipper remains open until it reaches the pin C^3 which closes the

nipper upon another bag tube. I have shown two such nippers and their operating mechanism, and it is evident that so far as my improvements are concerned one or more of these devices may be employed by simply reducing or enlarging the diameter of the cylinder C maintaining its surface speed the same.

As soon as the tube has been withdrawn from the plate E the said plate is caused to return to its original position, by the operation of the arm F cams and gears so that it shall be in the proper position to receive the next paper tube. As before explained, the gear M' is in effect substantially a rack, but moved by cam K, and as the arm F is oscillated about f as a center by cam K' the intermediate gear M, and gear N causes a proper rotation or oscillation of the plate E about e as a center. The movements of the arm F are governed by the cam K' and arm F', and is so timed that while permitting the rotation or oscillation of the plate E about its axis e, it insures the edge W moving exactly at the same speed of the surface speed of the cylinder C so as not to displace in any manner the tube.

While I have shown the nippers upon the cylinder C, they are not necessary, as the paper tube may be severed into bag tube sections W Fig. 10, but left connected by short connections w Fig. 11 so that it is in effect pulled by itself about cylinder C under the action of the rolls S'. The rollers S' may be cutting rolls which while drawing the tube section through sever the bag tube sections before they go to the pasting devices. This method of operating is indicated in Fig. 9. It will be observed that as the tube is bent over the cylinder C the upper layer will rise and pass above the finger E' of the former plate E.

J.

In this case the bag tube will have the diamond folds made upon the tube while still connected together. It will thus be seen that it is not necessary to employ the nippers upon the cylinder C, though it may be more desirable to use them.

It is evident that the mere mechanism for securing the several movements to the different parts may be modified or changed in various ways without departing from the spirit of the invention, and I do not, therefore, confine myself to the details of construction here shown.

What I claim as new and desire to secure by letters patent, is:-

1. In a paper bag machine, the combination of a rotating cylinder provided with one or more pairs of side folding fingers adapted to be moved toward or from each other, a forming plate also provided with side forming fingers adapted to be moved toward or from each other, means for operating said fingers at definite times during the formative action upon the bag tube, operating means for the forming plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder, the whole operating for the purpose of opening and forming the bottom of the bag tube, and means to move the bag tube with the cylinder.

2. In a paper bag machine, the combination of the rotating cylinder provided with one or more pairs of side folding fingers adapted to be moved toward or from each other, a forming plate also provided with side forming fingers adapted to be moved toward or from each other, means for operating said fingers at definite times during the formative action upon the bag tube, operating means for the forming plate adapted to

cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder for the purpose of opening and forming the bottom of the bag tube, a finger moving with the forming plate for receiving the upper sheet of the tube and lifting it during the formative action, power devices for returning the forming plate to its original position to receive a new bag tube, and means to move the bag tube with the cylinder.

3. In a paper bag machine, the combination of the rotating cylinder provided with one or more pairs of side folding fingers adapted to be moved toward or from each other, a forming plate also provided with side forming fingers adapted to be moved toward or from each other, means for operating said fingers at definite times during the formative action upon the bag tube, operating means for the forming plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder for the purpose of opening and forming the bottom of the bag tube, a finger moving with the forming plate for receiving the upper sheet of the tube and lifting it during the formative action, power devices for returning the forming plate to its original position to receive a new bag tube, means to sustain the rear of the forming plate clear of the surface of the revolving cylinder so as to permit the proper entrance of the paper bag between the former plate and the surface of the cylinder, and means to move the bag tube with the cylinder.

4. In a paper bag machine, the combination of the rotating cylinder provided with one or more pairs of side folding fingers adapted to be moved toward or from each other, a forming plate also provided with forming side fingers

adapted to be moved toward or from each other, means for operating said fingers at definite times during the formative action upon the bag tube, operating means for the forming plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder for the purpose of opening and forming the bottom of the bag tube, means to sustain the rear of the forming plate clear of the surface of the revolving cylinder so as to permit the proper entrance of the paper bag between the former plate and the surface of the cylinder, and means to move the bag tube with the cylinder.

5. In a paper bag machine, the combination of a rotating cylinder provided with one or more nippers, power devices for opening and closing the nippers at predetermined intervals of time, pivoted side forming fingers G G carried upon the surface of the cylinder and upon each side thereof so as to receive the bag tube between them, power devices for operating the fingers G, G at definite times during their movement forward with the cylinder, a forming plate E also provided with side forming fingers H H adapted to be brought into alignment above the fingers G G in the preliminary operation of forming the bag, a movable frame to which said forming plate is hinged, power devices for moving said movable frame, power devices for oscillating the said forming plate upon the movable frame so that its rear edge travels in conjunction with and at the same rate of speed as the cylinder, and means for operating the forming fingers of the former plate.

6. In a paper bag machine, the combination of a rotating cylinder provided with one or more nippers, power devices for opening and closing the nippers and predetermined intervals of

time, pivoted forming fingers G G carried upon the surface of the cylinder and upon each side thereof so as to receive the bag tube between them, power devices for operating the fingers G G at definite times during their movement forward with the cylinder, a forming plate E also provided with the forming fingers H H adapted to be brought into alignment above the fingers G G in the preliminary operation of forming the bag and also provided with a finger rearwardly extending at its forward end for separating the upper layer of the bag tube when opening the same during the oscillation of the plate, a movable frame to which said forming plate is hinged, power devices for moving said movable frame, power devices for oscillating the said forming plate upon the movable frame so that its rear edge travels in conjunction with and at the same rate of speed as the cylinder, and means for operating the forming fingers of the forming plate.

7. In a paper bag machine, the combination of the rotating cylinder for the bag tube provided with one or more pairs of folding fingers adapted to be moved toward or from each other, a forming plate also provided with forming fingers adapted to be moved toward or from each other, means for operating said fingers at definite times during the formative action upon the bag tube, operating means for the forming plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder for the purpose of opening and forming the bottom of the bag tube, and connecting mechanism for timing the movements of the rotating cylinder and the forming plate.

8. In a paper bag machine, the combination of a rotating

opening and closing the nippers and predetermined intervals of time, pivoted forming fingers G G carried upon the surface of the cylinder and upon each side thereof so as to receive the bag tube between them, power devices for operating the fingers G, G at definite times during their movement forward with the cylinder, a forming plate E also provided with forming fingers H H adapted to be brought into alignment above the fingers G G in the preliminary operation of forming the bag, a movable frame to which said forming plate is hinged, power devices for moving said movable frame, power devices for oscillating the said forming plate upon the movable frame so that its rear edge travels in conjunction with and at the same rate of speed as the cylinder, means for operating the forming fingers of the forming plate, and connecting devices for timing the movements of the movable frame the former plate and the rotating cylinder. 12.

bag tube, operating means for the forming plate adapted to 8.

gear M' as if it were a rack. This causes

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Fig 9 is a diagram illustrating the employment of a continuous or connected series of tubes to their being fed with the cylinder and obviating the necessity of nippers;

Fig 10 is a plan view of the paper tube employed in connection with Fig 9;

Fig 11 is an inverted plan view of same; and

Fig 12 is a longitudinal Section of the tube on line 2.1.

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As the motion of the arm F is irregular and not always in the same direction for one continuous movement of the former plate E, I cause the gear M' to be moved somewhat to compensate for this. On the shaft J I arrange a cam K which acts upon a rod k to reciprocate it, and this by link K' rocks the gear or rack M'.

The cams K and K' insure a proper return movement to the arm F and former plate E, and in time with the rotations of the cylinder C. In place of these devices for controlling the movement

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of the plate E relatively to the cylinder C, the said plate may be moved or operated by any other suitable means. The return movement of the plate E is unimportant — so long as it is secured in time to receive a new bag tube or section there-

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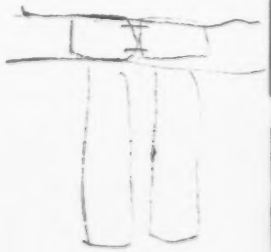
While I have shown nippers upon the cylinder C, they are not necessary, as the paper tube may be severed into bag tube sections W Fig 10, but left connected by short connections W Fig 11 so that it is in effect pulled by itself ~~through~~ about cylinder C under the action of the rolls S'. The rollers S' may be cutting rolls which while drawing the tube section through sever the bag tube sections before they go to the pasting devices. This method of operating is indicated in Fig. 9 It will be observed that as the tube is bent over the cylinder C the upper layer will rise and pass above the finger E' of the former plate E. In this case the bag tube will have the diamond fold made upon the tube while still connected together - It will thus be seen that it is not necessary to employ the nippers upon the cylinder C, though it may be more desirable to use them -



My invention has reference to paper bag machines, and consists of certain improvements which are fully described in the following specification and are shown in the accompanying drawings which form a part thereof.

This application comprehends certain mechanism for forming a satchel bottom upon the tube in the manufacture of paper bags and has for its object the production of a perfectly formed satchel bottom in a speedy and accurate manner. My improvements briefly stated may be described as follows:

The tube is received upon a revolving cylinder and carried forward by a nipper which clamps the lower sheet of the tube, or by other means hereinafter described. The upper sheet of the tube passes above a finger upon a movable forming plate ~~which is~~ securely held at a short distance from the revolving cylinder and between which and the cylinder the tube is guided. The forming plate is then caused to rotate about its rear edge simultaneously with its movement or travel with the revolving cylinder, thereby opening the end of the ~~back~~ tube, spreading the side folds and marking a creased line transversely. Simultaneously with this, forming fingers are projected into the side folds, one pair being adapted to the cylinder and the other pair to the forming plate. A continued movement of the parts cause the upper layer or sheet of the tube to be completely turned backward upon itself, and at the same time the forming fingers together with the other parts insure the proper formation of the diamond fold. The tube in this shape leaves the revolving cylinder, passes to the pasting devices and thence to the folder.

The invention will be better understood by reference to the accompanying drawings in which;-

Fig. 1 is a side elevation of a paper bag machine embodying my improvements.

Figure 2 is a plan view of a portion of the same.

Figures 3 and 4 are sectional elevations on the line xx of Figure 2 showing the operations of the parts in the formation of the bottom; and

Figures 5, 6, 7 and 8 are perspective views illustrating the several manipulations which take place upon the bag tube in its formation under the action of the nipper and the forming fingers.

A is the main frame of the machine. B is a shaft carried upon the main frame and upon which is supported the forming cylinder C which may be provided with one or more nippers c adapted to be closed and held closed by the action of the spring c', and opened by the action of a pin C^2 acting upon the star wheel C'. The nipper is also controlled as to its being closed by the action of the pin C^3 also acting upon the star wheel. These devices operate to enable the nipper to close upon the forward edge of the under layer of the bag tube, and after the formation or creasing of the bottom into the diamond folds, to release the bag tube. D D are two feed or guide rollers adapted to properly deliver the bag to the cylinder C.

E is a forming plate and is hinged at e to the arm F journalled to the main frame at f. This arm F is drawn toward the cylinder C by a spring F' and is moved away from the cylinder about the axis f by cam K' and arm F' carrying cam.

L is a rotating power shaft and is driven by a belt pulley L' and operates the cylinder C by gears M^2 M^3 Spur gears M' M N operate the axis e of the forming plate E when the arm F is moved. Of these gears M' is fixed and hence when the arm F is moved, its gears M_3 ... upon

motion to the plate E about e as an axis. [2]

The cylinder C is pivoted upon its periphery fingers G G which are normally out of line with the bag tube, but which may be projected inwardly by the action of a cam I' secured to the main frame A. The fingers G G are connected together by arms g and a link G' arranged in the under side of the cylinder surface, and one of them is further provided with an arm G^2 adapted to come in contact with the cam I during the rotation of the cylinder and thus ~~the fingers to~~ cause ~~them~~ said fingers to be projected inward as indicated in dotted lines in Figure 2 so as to enter the bellows side folds of the tube. The former plate E has its rear edge made sharp as at W so that when it presses downward upon the bag tube it forms a transverse crease about which the paper bends as clearly shown in Figs 4 and 6. This former plate E is also provided with fingers H H corresponding to the fingers G G which are connected by arms h and link H' precisely as are connected the fingers G G, and are operated by means of a spring J in one direction to hold them out of action, and a stationary cam I acting upon an arm or projection H^2 to move them inward or in the other direction so that they enter the bellows side folds precisely as at the fingers G G. Stops J limit their movement in one direction. The rear or free end of the former plate E is provided with eyes E^2 which are received upon projections A', as clearly shown in Fig. 3 so as to be maintained out of the line of the bag tube in entering between the said plate and the cylinder C after it has been caught by the nipper c and moved forward. When the bag tube is moved to the position shown in Fig. 3, the upper layer of the paper is moved over a finger E' arranged adjacent to the axis e and below the former plate E. As the plate E is moved forward with the bag tube, the eye E^2 leaves the projection A', as shown in Fig. 4, and the edge W presses down upon

adapted to be moved toward or from each other, means for operating said fingers at definite times during the formative action upon the bag tube, ~~and~~ operating means for the forming plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder, the whole operating and means to move the bag tube with the cylinder for the purpose of opening and forming the bottom of the bag tube.

2. In a paper bag machine, the combination of the rotating cylinder provided with one or more ~~nippers and one or more~~ pairs of side folding fingers adapted to be moved toward or from each other, a forming plate also provided with side forming fingers adapted to be moved toward or from each other, means for operating said fingers at definite times during the formative action upon the bag tube, ~~and~~ operating means for the forming plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder for the purpose of opening and forming the bottom of the bag tube, a finger moving with the forming plate for receiving the upper sheet of the tube and lifting it during the formative action, ~~and~~ power devices for re-turning the forming plate to its original position to receive a new bag tube, and means to move the bag tube with the cylinder.

3. In a paper bag machine, the combination of the rotating cylinder provided with one or more ~~nippers and one or more~~ pairs of side folding fingers adapted to be moved toward or from each other, a forming plate also provided with side forming fingers adapted to be moved toward or from each other, means for operating said fingers at definite times during the formative action upon the bag tube, ~~and~~ operating means for the forming plate adapted to cause the said plate to oscillate about its rear

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gears M' M N operate the axis 9 of the forming plate

edge upon the surface of the cylinder during the rotary movement of said cylinder for the purpose of opening and forming the bottom of the bag tube, a finger moving with the forming plate for receiving the upper sheet of the tube and lifting it during the formative action, ~~and~~ power devices for ^re^turning the forming plate to its original position to receive a new bag tube, ~~and~~ means to sustain the ~~area~~ rear of the forming plate clear of the surface of the revolving cylinder so as to permit the proper entrance of the paper bag between the former plate and the surface of the cylinder, ^and means to move the bag tube with the cylinder^.

4. In a paper bag machine, the combination of the rotating cylinder provided ^with^ one or more ~~nippers and one or more~~ pairs of ^side^ folding fingers adapted to be moved toward or from each other, a forming plate also provided with forming ^side^ fingers adapted to be moved toward or from each other, means for operating ^said^ fingers at definite times during the formative action upon the bag tube, ~~and~~ operating means for the forming plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder for the purpose of opening and forming the bottom of the bag tube, ~~and~~ means to sustain the ~~area~~ rear of the forming plate clear of the surface of the revolving cylinder so as to permit the proper entrance of the paper bag between the former plate and the surface of the cylinder, ^said means to move the bag tube with the cylinder^.

5. In a paper bag machine, the combination of a rotating cylinder provided with one or more nippers, power devices for opening and closing the nippers ~~and~~ at predetermined intervals of time ~~of~~ pivoted ^side^ forming fingers G G carried upon the surface of the cylinder and upon each side thereof so as to receive the bag tube between them, power devices for operating the fingers G,

G at definite times during their movement forward with the cylinder, a forming plate E also provided with side forming fingers H/ H/ adapted to be brought into alignment above the fingers G/ G/ in the preliminary operation of forming the bag, a movable frame to which said forming plate is hinged, power devices for moving said movable frame, power devices for oscillating the said forming plate upon the movable frame so that its ~~area~~ rear edge travels in conjunction with and at the same rate of speed as the cylinder, and means for operating the forming fingers of the former plate.

6. In a paper bag machine, the combination of a rotating cylinder provided with one or more nippers, power devices for opening and closing the nippers and predetermined intervals of pivoted forming fingers G/ G/ carried upon the surface of the cylinder and upon each side thereof so as to receive the bag tube between them, power devices for operating the fingers G/ G at definite times during their movement forward with the cylinder, ~~and~~ a forming plate E also provided with forming fingers H/H/ adapted to be brought into alignment above the fingers G/ G/ in the preliminary operation of forming the bag/ and also provided with a finger rearwardly extending at its forward end for separating the upper layer of the bag tube ~~for~~ when opening the same during the oscillation of the plate, a movable frame to which said forming plat· is hinged, power devices for moving said movable frame, power devices for oscillating the said forming plate upon the movable frame so that its ~~area~~ rear edge travels in conjunction with and at the same rate of speed as the cylinder, and means for operating the forming fingers of the forming plate.

7. In a paper bag machine, the combination of the rotating cylinder for the bag tube ~~provided one or more nippers and~~ provided with one or more

pairs of folding fingers adapted to be moved toward or from each other, a forming plate also provided with forming fingers adapted to be moved toward or from each other, means for operating said fingers at definite times during the formative action upon the bag tube, and operating means for the forming plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder for the purpose of opening and forming the bottom of the bag tube, and connecting mechanism for timing the movements of the rotating cylinder and the forming plate.

8. In a paper bag machine, the combination of a rotating cylinder provided with one or more nippers, power devices for opening and closing the nippers and predetermined intervals of time, pivoted forming fingers G, G' carried upon the surface of the cylinder and upon each side thereof so as to receive the bag tube between them, power devices for operating the fingers G, G' at definite times during their movement forward with the cylinder, a forming plate E also provided with forming fingers H, H' adapted to be brought into alignment above the fingers G, G' in the preliminary operation of forming the bag, a movable frame to which said forming plate is hinged, power devices for moving said movable frame, power devices for oscillating the said forming plate upon the movable frame so that its rear edge travels in conjunction with and at the same rate of speed as the cylinder, and means for operating the forming fingers of the forming plate, and connecting devices for timing the movements of the movable frame, the former plate and the rotating cylinder.

669

Case A 3 sheets

nesses.

Inventor:
William Liddell
By
Attorney.

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Case A 3 sheets

FIG. 2.

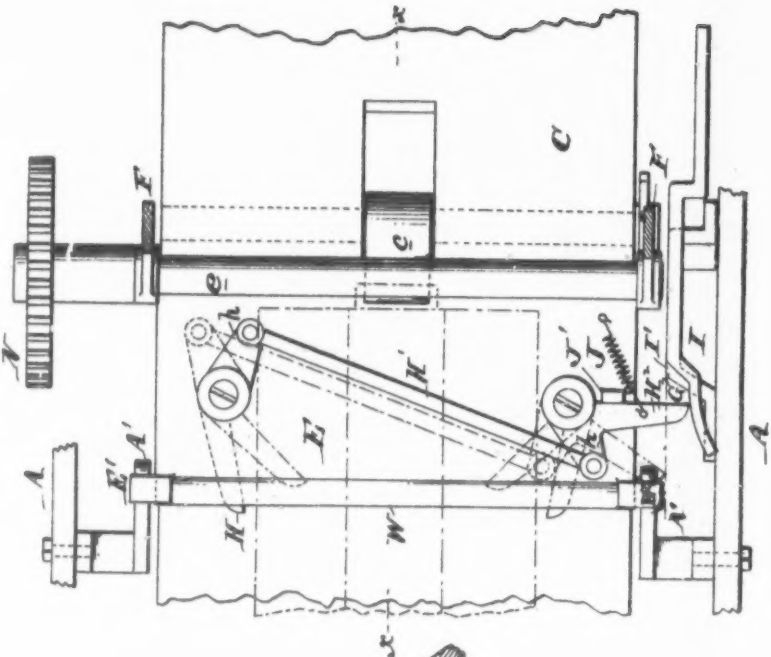


FIG. 3

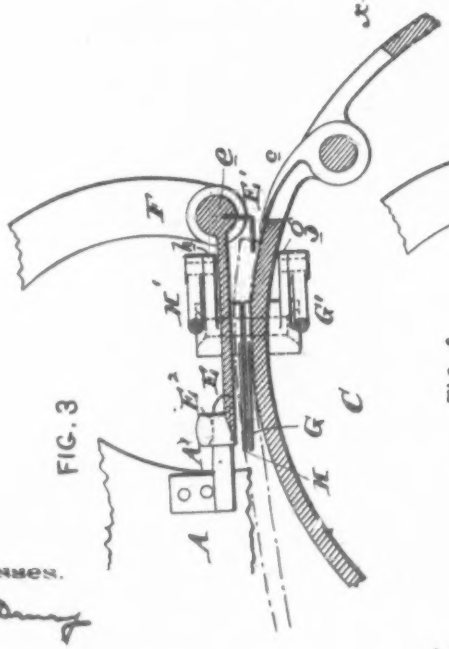
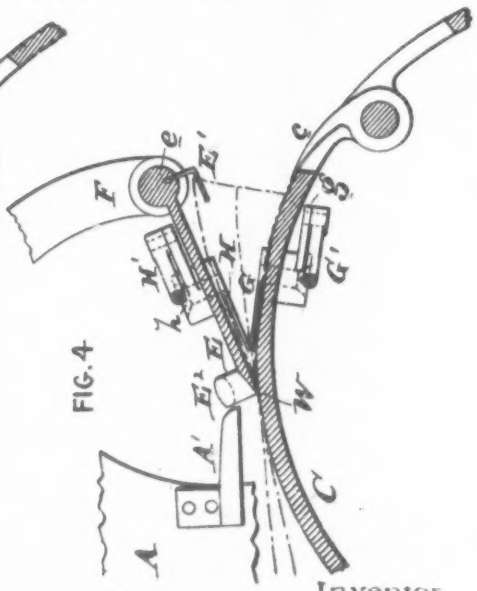


FIG. 4



Witnesses.

Henry Dewey

Inventor

William Liddell

By Thos. H. Brooks

Attorney

Case A 3 sheets

FIG. 5

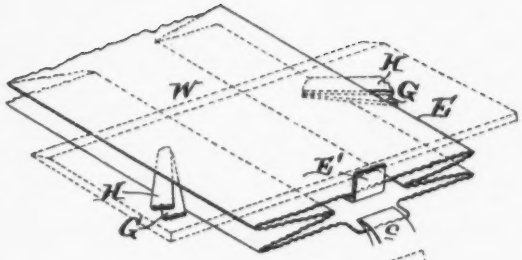


FIG. 6

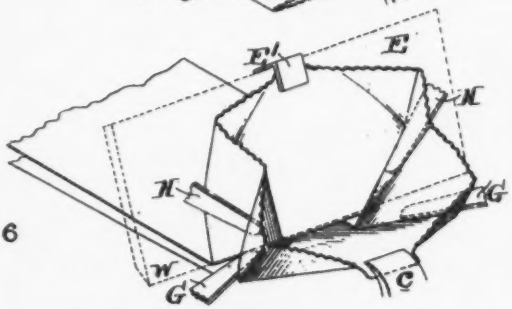


FIG. 7.

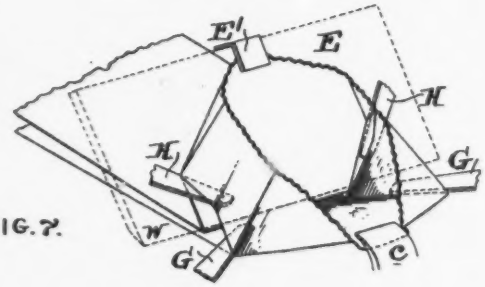
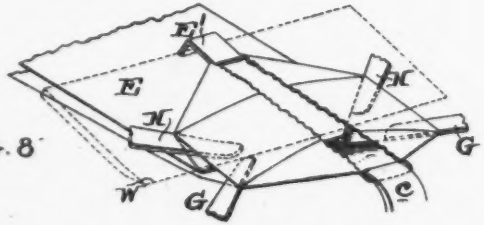


FIG. 8

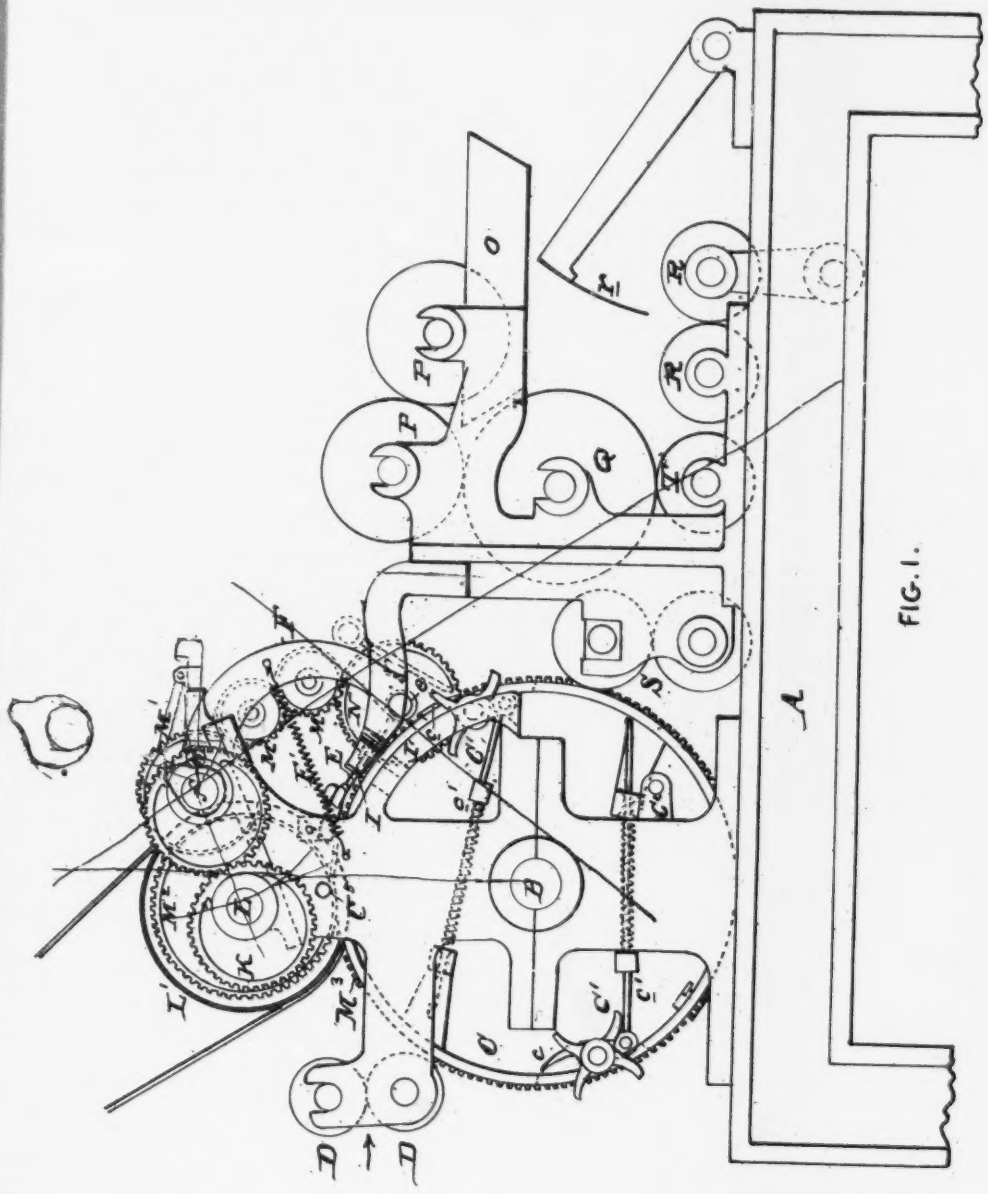


Witnesses.

Inventor.

Attorney.

Case 1 3 sheets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U. S. CIRCUIT COURT, DISTRICT OF MAINE.
EASTERN PAPER BAG CO.
v.
CONTINENTAL PAPER BAG CO.
Patent No. 558,969.
674
COMPLAINANT'S EXHIBIT "HUNTER FILE OF CASE B",
July 23, 1903, J. A. S. Special Examiner.

William Liddell No. 576,269 Filed Jan. 21. 1896 Case 13
53 Garfield Place
Brooklyn N.Y.

INVENTION Paper Bag Machines

Rejection March 14. 1896
Amended March 31. 1896
Rejection April 7 1896
Amended April 27. 1896
Rejection
Amended
Rejection
Amended
Rejection
Amended
Rejection
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Rejection
Amended

APPEALS

TO THE BOARD OF EXAMINERS.

Taken Hearing
Decision

TO THE COMMISSIONER.

Taken Hearing
Decisson

INTERLOCUTORY.

Taken Hearing
Decision

REMARKS.

INTERFERENCE.

ALLOWED June 2. 1896.

PATENTED

No. 564,288 Date July 21. 1896 Received July 22 96.

RUDOLPH M. HUNTER, M. E., 926 WALNUT ST., PHILADELPHIA, PA.

(2–026.)

Issue Division.
All communications should be addressed to "The Commissioner of Patents, Washington, D. C."

DEPARTMENT OF THE INTERIOR,

U. S. Patent Office,

Washington, D. C., June 30, 1826

William Liddell assn
of R M Stanley
926 Walnut St
Phila Pa

SIR:

You are informed that the final fee of **TWENTY DOLLARS** has been received in your application for Improvement in

Paper Bag Machine

576269

Very respectfully,

Thos. S. Sylvester
Commissioner of Patents.

27

919:3m

All communications should be addressed to The Commissioner of Patents, Washington, D.C.

DEPARTMENT OF THE INTERIOR.

United States Patent Office,

WASHINGTON, D.C., JUNE 27, 1896.

MR. RUDOLPH M. HUNTER,

#926 WALNUT ST.,

PHILADELPHIA, PA.

Sir:

You are informed in reply to yours of the 24th instant, that the application of William Liddell, serial number 576,269, for an improvement in "Paper Bag Machines," allowed on the 2d instant, is found to have been assigned to "The Eastern Paper Bag Company, but such assignment was not entered upon the file at the time that the notice of allowance was issued.

The patent will issue to the assignee upon the payment of the final fee.

By direction of the Commissioner.

Very respectfully,

Geo. L. Norton

Chief Clerk.

In reply refer to letter
No. 81867, June 25, 1896.

811

Issue Division.

All communications should be addressed to "The Commissioner of Patents, Washington, D. C."

(2-024.) Serial No. 376269

DEPARTMENT OF THE INTERIOR,

U. S. Patent Office,

Washington, D. C., June 2, 1892

William Leiddell
c/o R. M. Hunter
926 Walnut st
Phila Pa.

PLEASE REFER IN ANY LETTER TO THE SERIAL NUMBER AT THE HEAD OF THIS OFFICE

SIR:—Your APPLICATION for a patent for an IMPROVEMENT IN

Paper Bag Machines

Filed Jan 21' 92, has been examined and ALLOWED.

The final fee, Twenty Dollars, must be paid, and the Letters Patent bear date as of a day not later than SIX MONTHS from the time of this present notice of allowance.

If the final fee is not paid within that period the patent will be withheld, and your only relief will be by a renewal of the application, with additional fees, under the provisions of Section 4897, Revised Statutes. The Office aims to deliver patents upon the day of their date, and on which their term begins to run; but to do this properly applicants will be expected to pay their final fees at least TWENTY DAYS prior to the conclusion of the six months allowed them by law. The printing, photolithographing, and engrossing of the several patent parts preparatory to final signing and sealing, will consume the intervening time, and such work will not be done until after payment of the necessary fees.

When you send the final fee you will also send, DISTINCTLY AND PLAINLY WRITTEN, the name of the INVENTOR, and TITLE OF INVENTION AS ABOVE GIVEN, DATE OF ALLOWANCE (which is the date of this circular), DATE OF FILING, and, if assigned, the NAMES OF THE ASSIGNEES.

If you desire to have the patent issue to ASSIGNEES, an assignment containing a REQUEST to that effect, together with the FEE for recording the same, must be filed in this Office on or before the date of payment of final fee.

Additional copies of Specifications and Drawings will be charged for at the following rates: Single Copies, uncertified, 10 cents each. The money should accompany the order.

Very respectfully,

John S. Seymour

Commissioner of Patents.

☞ After allowance, and prior to payment of the final fee, applicants should carefully scrutinize the description to see that their statements and language are correct, as mistakes not incurred through the fault of the office, and not affording legal grounds for reissues, will not be corrected after the delivery of the letters patent to the patentee or his agent. 27

The within title is that given by the Examiner in charge, as most appropriate to your invention. Should you desire a change in the same, satisfactory reasons MUST be given therefor on or before the payment of the final fee.

William Liddell,

Paper Bag Machines,

Jan.21, 1896 215

576,269 B

Apr.27,1896.

I have considered the last action and carefully examined the Lorenz patent referred to. In this Lorenz patent the cam 52 performs the function of moving the bed to and from the forming plate during the operation of opening the bag tube. The cam 52 is required to operate during the entire process of forming the bottom. In applicant's case the cam is specifically stated for holding the rear edge of the former plate from the bed when receiving the tube, therefore the devices are entirely different. The cam does not hold either the forming plate or the bed of the Lorenz machine away from the other part. In applicant's case the cam performs this function before the opening operation takes place. As soon as the opening operation takes place, applicant's cam is out of action, whereas the cam 52 of the Lorenz patent then comes into operation, performing an entirely different function. In applicant's case his cam is in operation at the time when no cam is in operation in the Lorenz device, and vice versa. For this reason it is believed that the Examiner is in error in holding that the Lowenz device is substantially the equivalent of applicant's. Furthermore there are material differences between the features claimed by applicant and what is shown in the Lorenz patent, and I do not consider that the Examiner should ignore these differences.

The machines are certainly very materially different, even if there are some similarities, and I do not consider that the Lorenz patent should be given such an interpretation as to ~~prevent proper head of~~ prevent further development of improvements upon this class of machinery. I certainly believe that claims 3 to 6 are allowable over Lorenz.

Insert the following claims:

"7. In a paper bag machine, the combination of a rotary reciprocating bed, an oscillating reciprocating former plate adapted to move simultaneously with the bed and operated therewith like a hinge, a stationary axis to which the former plate is linked, power devices to simultaneously operate the said bed and also the said plate, means upon both the bed and plate to hold and crease the bag tube during their movements, and a cam device for temporarily holding the rear edge of the former plate from the bed when receiving the tube and at the time when the opening operation of the tube is not taking place.

"8. In a paper bag machine, the combination of a rotary reciprocating bed, an oscillating reciprocating former plate adapted to move simultaneously with the bed and operate therewith like a hinge, a pivoted link for sustaining the weight of the forward end of the former plate, power devices to simultaneously operate the said bed and also the rear end of said plate, means upon both the bed and plate to hold the ends of thetube layers so as to open the end of the tube, folding fingers to crease the bag tube on diagonal lines during their movements, and a cam device for temporarily hold-

ing the rear edge of the former plate from the bed when receiving the tube and at the time when the opening operation of the tube is not taking place.

Respectfully,

DEPARTMENT OF THE INTERIOR.

UNITED STATES PATENT OFFICE,

Dictated. WASHINGTON, D. C., April 7, 1896.

William Liddell,

Care R. M. Hunter,

926 Walnut Street,

Philadelphia, Pa.

MAILED APR 7 1896 PATENT OFFICE.

Please find below a communication from the ***EXAMINER*** *in charge of your application* #576,269, filed Jan. 21, 1896, Paper Bag Machines.

John S. Seymour

Commissioner of Patents.

This application has been considered in connection with the amendment of the 1st instant.

Claims 3 to 6 inclusive are again rejected upon the references and for the reasons of record. As before stated, the reciprocating bed shown in the Lorenz patent is regarded as the full equivalent of the oscillating bed covered by these claims. With respect to the cam device covered by these claims and shown upon the drawings, for holding the rear end of the former plate away from the bed, it is stated that the cam marked 52, shown in the Lorenz et al patent, is regarded as its full equivalent. This cam, it is true, operates to throw the bed to and from the forming plate, while in applicant's machine the former plate is thrown towards and from the bed. This, however, is regarded as a mere reversal and does not amount to invention. It is again held that to add the fingers, shown to be old in the Purvis patent, to the opening device, would not require invention.

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818

Mar. 31, 1896.

William Liddell.

Paper Bag Machines.
Jan. 21, 1896, 215
576,269 B

The Examiner has rejected this case upon Lorenz in view of Purvis. I have studied fully copies of the patents cited, and do not think that this decision is just. I would like to explain here that Purvis and Liddell are developing a satchel bottom paper bag machines for the Eastern Paper Bag Co., and this application of Mr. Liddell's is therefore owned by the owners of the Purvis patent. For this reason there is therefore some similarity between the fingers for defining the triangular folds of the sides of the Bottom, as these fingers are desired to be used in all of their machines. The Lorenz patent is a complicated machine having materially different operations than those of this application, and it seems to me that while there may be some similarities there are material differences, at least amply sufficient for the allowance of the claims.

In claim 1, line 4, before "power" insert "a stationary "axis to which the former plate is linked,".

In claim 2, line 4, before "power" insert "a pivoted "link for sustaining the weight of the forward end of the "former plate,"; also line 5 after "the" insert "rear end of"

These claims without the amendments were specific to the rotary reciprocating bed which I considered very materially different from the simply reciprocating bed of Lorenz.

Furthermore these claims call for means upon the bed and plate to hold and crease the bag tube. These devices are not completely found in Lorenz, nor are they completely found in Purvis. Purvis has a portion and Lorenz has the other portion, and therefore it is not reasonable to assume that a structure as here claimed does not involve patentable inventions over these inventions. I have, however, amended the claims so as to bring out applicant's general structure more fully, and it is believed that there will be no objection now to allowing the claims. [redacted].

With regard to claims 3, 4, 5 and 6, I wish to call the Examiner's attention to the fact that all of these claims call for a cam device for holding the rear edge of the former plate from the bed when receiving the bag tube, which in applicant's structure is a most important element and especially necessary in view of the rear knife and bed creasing element. This feature alone not being shown in the two references, makes these claims allowable. It is though that the Examiner has overlooked this in his general rejection.

I think the claims should be allowed in their present form in view of the amendment and the explanation here given.

Respectfully,

Attorney.

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2–020.

All communications should be addressed to "The Commissioner of Patents, Washington, D. C."

Series of 1880.
No. 576[illegible]
Lease D

DEPARTMENT OF THE INTERIOR,

United States Patent Office,

Washington, D. C., Jan 21, 1896

SIR:

I have to acknowledge the receipt of the petition, specification, oath, and drawing of your alleged improvement in Paper Bag Machines

with Fifteen Dollars as the first fee payable thereon.

The papers are duly filed, and your application for a patent will be taken up for examination in its order

You will be duly advised of the examination.

Very respectfully,

John S. Seymour

Commissioner of Patents.

Any communication respecting this application should give the serial number, date of filing, and title of invention.

William Liddell
% R. M. Hunter
926 Walnut St. Philada. Pa.

NOTE.—In order to constitute an application for a patent, the inventor is by law required to furnish his petition, specification, oath, and drawings (where the nature of the case admits of drawings) and to pay the required fee.

No application is considered as complete, nor can any official action be had thereon, until all its parts, as herein specified, are furnished in due form by the inventor or applicant.

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My invention has reference to paper bag machines, and consists of certain improvements which are fully set forth in the following specification and shown in the accompanying drawings, which form part thereof.

This application comprehends certain improvements in the class of machines adapted to the manufacture of bellows side fold paper bags having satchel bottoms. In another pending application, case A, I have described certain improvements comprehending a rotating cylinder combined with an oscillating forming plate, and with the necessary folding fingers and nippers for producing in a continuous manner satchel bottoms to bellows side fold tubes. My present improvements comprehend certain modifications of an apparatus of that character. In this case I employ a rotary reciprocating cylinder having a flat bed combined with a rotary reciprocating forming plate, and nippers and folding fingers upon both of said parts, whereby, with each reciprocation a paper tube shall be received and folded with the necessary folds to form a satchel bottom upon the tube, and then be delivered for subsequent pasting operation, which latter, however, forms no part of my invention.

My invention will be better understood by reference to the accompanying drawings, in which:-

Fig. 1 is a side elevation of my improved paper bag machine in position adapted to receive the paper tube;

Fig. 2 is a similar view showing the machine when the end of the tube has been opened and the necessary folds formed therein;

Fig. 3 is a plan view of Fig. 1 with the portion above the dotted lines x-x removed;

Fig. 4 is a sectional elevation on line y-y of Fig. 3;

Fig. 5 is a plan view of the rotary reciprocating cylinder; and

Fig. 6 is a perspective view of the cam frame.

A is the main frame of the machine. b is a rocking shaft upon which is firmly secured the rotary reciprocating cylinder B which is provided with the falt bed T. The shaft b is provided on the end with an arm B^2 which connects by a link or connecting rod C^2 with a crank C, which latter is driven by the shaft c and power wheel C'. By the rotation of the shaft c the shaft b is caused to rock in its bearings in the main frame A, and thereby produces a rotary reciprocating motion to the bed T of the cylinder B.

Arranged above the cylinder B and corresponding to the Bed T thereof is a former plate E hinged at the rear end at e o the arms F carried upon a shaft f which is journalled in the main frame A. The forward end of the said plate E has a creasing edge W which in the operation of forming the bottom enters a small groove w in the bed plate T to impart a positive transverse crease to the paper tube. The rear end is provided with journals N which work in slotted bearings in the arm M. When the parts are in the position shown in Fig. 1 the journals N rest upon cam surfaces n, and thus hold the rear end W clear of the bed T, so as to form a space between the parts T and E to permit the tube to pass as it is delivered thereto by the feeding rolls D, D. The rear end of the former plate E is provided with a spring actuated nip

per E', which when in the position shown in Fig. 1 is held open by the pin or rod E^2. The rear end of the bed T is also provided with a similar spring actuated nipper B', which when in the position shown in Fig. 1 is held open by the pin or rod $\underline{c}^2$. When the tube is run in between the parts E and T the nippers E', B' are brought into position to nip the part and also the sides of the tube respectively, and upon the parts being moved the nippers are liberated and close upon the paper, after which time they retain possession of the said ends of the tube and cause them to be opened as the position indicated in Fig. 2 is approached.

Upon each side of the bed T is arranged a pivoted folding finger G having an arm G^2 to operate it, and combined with a spring G' to hold it normally out of action. The fingers are forced inward against the action of the spring G' by the cam surfaces I' during the rotary reciprocation of the cylinder B. The plate E is also provided with similar folding fingers H, H, which are also actuated by means of arms H^2 and held out of operating position by springs H'. In the formation of the bottom of the tube the cams I operate upon the arms H^2 and throw the fingers inwardly insuring them securing such position as to produce the proper folding of the paper.

As the apparatus changes from the position of the parts shown in Fig. 1 to the position shown in Fig. 2, the nippers retain custody of the ends of the paper tube. The folding fingers G, H are thrust into the bellows side folds at the proper angle, and as the parts reach the position shown in Fig. 2 the bottom of the tube will have one of its layers

folded backward, so that as the folded tube passes through the delivery rolls S the diamond folds will have been formed and ready to receive the pasting and final folding operation which may be performed in any of the usual manners. Just prior to the parts reaching the position shown in Fig. 2 the fingers H and G are liberated from the control of the cams I and I', and this permits the springs H' and G' to throw the said fingers out of the way of the tube, so that the latter may be readily withdrawn. Furthermore it will be observed that the spring nippers are brought into contact with pins or rods E^3, C^3 insuring their being opened at the proper instant and after they have performed their functions.

To insure the proper transverse creasing of the tube, I have before described that the rear edge W of the former plate E creases the paper in the transverse groove w of the bed plate T, and this action remains during the folding operation, but the paper tube is released at the completion of the operation by the action of the spring F', lifting the plate E and its arm F vertically and sustaining it in the position shown just at the completion of the reciprocation of the cylinder B. In this manner the transverse crease is positively formed and at the proper instant the tube is liberated for delivery.

As soon as these actions have taken place and the tube is delivered by the rotary delivery roll S which has pins s and is moved by a frame s^2, link S^3, arm S^4 and lug S^5 on the shaft b. The lug b acts through said parts to draw the roller S forward when the bed T is fully lowered so that the pins catch the tube and carry it off between rolls S and S

to the pasting and folding devices not shown. When this is accomplished the parts are returned to their original position shown in Fig. 1.

Anyother form of feed and delivery for the tube may be employed in lieu of that shown.

I do not confine myself to the details of construction, as they may be modified in various ways without departing from the principles of my invention.

Having now described my invention what I claim as new and desire to secure by letters patent is:

OK 1st. In a paper bag machine, the combination of a rotary reciprocating bed, an oscillating reciprocating former plate adapted to move simultaneously with the bed and operated therewith like a hinge, a stationary axis to which the former plate is linked, power devices to simultaneously operate the said bed and also the said plate, and means upon both the bed and plate to hold and crease the bag tube during their movements.

OK 2nd. In a paper bag machine, the combination of a rotary reciprocating bed, an oscillating reciprocating former plate adapted to move simultaneously with the bed and operate therewith like a hinge, a link for sustaining the weight of the forward end of former plate power devices to simultaneously operate the said bed and also the rear end of said plate, and means upon both the bed and plate to hold the ends of the tube layers so as to open the end of the tube, and folding fingers to crease the bag tube on diagonal lines during their movements.

3rd. In a paper bag machine, the combination of a rotary reciprocating bed, an oscillating reciprocating former plate adapted to move simultaneously with the bed and operate therewith like ahinge, power devices to simultaneously

operate both the said bed and former plate, a cam device for holding the rear edge of the former plate from the bed when receiving the bag tube, and clamps upon the forward edges of the bed and former plate to hold the two layers of the tube and separate them during the operations of the said bed and former plate.

4. In a paper bag machine, the combination of a rotary reciprocating bed, an oscillating reciprocating former plate adapted to move simultaneously with the bed and operate therewith like a hinge, power devices to simultaneously operate both the said bed and former plate, a cam device for holding the rear edge of the former plate from the bed when receiving the bag tube, folding or creasing fingers upon the former plate and bed to enter the bellows side folds of the tube to make the oblique creases or folds, and clamps upon the forward edges of the bed and former plate to hold the two layers of the tube and separate them during the operation of the said bed and former plate.

5. In a paper bag machine, the combination of a rotary reciprocating bed, an oscillating reciprocating former plate adapted to move simultaneously with the bed and operate therewith like a hinge, power devices to simultaneously operate both the said bed and former plate, a cam device for holding the rear edge of the former plate from the bed when receiving the bag tube, clamps upon the forward edges of the bed and former plate to hold the two layers of the tube and separate them during the operation of the said bed and former plate, and means for opening said clamps when the bed and former plate reach the end of their extreme movements.

6. In a paper bag machine, the combination of a rotary reciprocating bed, an oscillating reciprocating former plate adapted to move simultaneously with the bed and operate therewith like a hinge, power devices for reciprocating the bed and former plate simultaneously, feeding devices for feeding the bag tubes between the bed and former plate when at rest, cam devices for holding the bed and former plate separated to permit the entrance of the tube, and means on the bed and former plate to open the end of the bag tube and properly crease it to assist in forming a satchel bottom bag.

Wm. Liddell, Case B.

My invention has reference to paper bag machines, and consists of certain improvements which are fully set forth in the following specification and shown in the accompanying drawings, which form part thereof.

This application comprehends certain improvements in the class of machines adapted to the manufacture of bell, side fold paper bags having satchel bottoms. In another pending application, case A, I have described certain improvements comprehending a rotating cylinder combined with an oscillating forming plate, ~~combining~~ and with the necessary folding fingers and nippers for producing in a continuous manner satchel bottoms to bell, side fold tubes. My present improvements comprehend certain modifications of an apparatus of that character. In this case I employ a rotary reciprocating cylinder having a flat bed combined with a rotary reciprocating forming plate, and ~~necessary~~ nippers and folding fingers upon both of said parts, whereby, with each reciprocation a paper tube shall be received and folded with the necessary folds to form a satchel bottom upon the tube, and then delivered for subsequent pasting operation, which latter, however, forms no ~~special~~ part of my invention.

My invention will be better understood by reference to the accompanying drawings, which :-

Fig. 1 is a side elevation of my improved paper bag machine in position adapted to receive the paper tube;

Fig. 2 is a similar view showing the machine when the end of the tube has been opened and the necessary folds formed therein;

Fig. 3 is a plan view of Fig. 1 with the portion above the dotted lines x-x removed;

Fig. 4 is a sectional elevation on line y-y of Fig. 3;

Fig. 5 is a plan view of the rotary reciprocating cylinder; and

Fig. 6 is a perspective view of the cam frame.

A is the main frame of the machine. b is a rocking shaft upon which is firmly secured the rotary reciprocating cylinder B which is provided with the flat bed T. The shaft b is provided on the end with an arm B^2 which connects by a link or connecting rod C^2 with a crank C, which latter is driven by the shaft c and power wheel C'. By the rotation of the shaft c the shaft b is caused to rock in its bearings in the main frame A, and thereby produces a rotary reciprocating motion to the bed T of the cylinder B.

Arranged above the cylinder B and corresponding to the bed T thereof is a former plate E hinged at the rear end at e to the arm F carried upon a shaft f journalled in the main frame A. The forward end of the said plate E has a creasing edge W, which in the operation of forming the bottom enters a small groove w in the bed plate T to impart a positive transverse crease to the paper tube. The rear end is provided with journals N which work in slotted bearings in the arm M. When the parts are in the position shown in Fig. 1 the journals N rest upon cam surfaces n, and thus hold the rear end W clear of the bed T, so as to form a space between the parts T and E to permit the tube to pass as it is delivered thereto by the feeding rolls D, D. The rear end of the former plate E is provided with a spring actuated nipper

R', which when in the position shown in Fig. 1 is held open by the pin or rod R^2. The rear end of the bed T is also provided with a similar spring actuated nipper B', which when in the position shown in Fig. 1 is held open by the pin or rod C^2. When the tube is run in between the parts R and T the nippers R', B' are brought into position to nip the part and also the sides of the tube respectively, and upon the parts being moved the nippers are liberated and close upon the paper, after which time they retain possession of the said ends of the tube and cause them to be opened as the position indicated in Fig. 2 is approached. Upon each side of the bed T is arranged a pivoted folding finger G having an arm G^2 to operate it, and combined with a spring G' to hold it normally out of action. The fingers are forced inward against the action of the spring G' by the cam surfaces I' during the rotary reciprocation of the cylinder B. The plate R is also provided with similar folding fingers H, H, which are also actuated by means of arms H^2 and held out of operating position by springs H'. In the formation of the bottom of the tube the cams I operate upon the arms H^2 and throw the fingers inwardly insuring them securing such position as to produce the proper folding of the paper. ~~As the apparatus~~

As the apparatus changes from the position of the parts shown in Fig. 1 to the position shown in Fig. 2, the nippers retain custody of the end of the paper tube. ~~shaft wheel~~. The folding fingers G, H are thrust into the bell ~~o~~ side folds at the proper angle, and as the parts reach the position shown in Fig. 2 the bottom of the tube will have one of its layers folded backward, so that as the folded tube passes through the delivery rolls S

the diamond folds will have been formed and ready to receive the pasting and final folding operation which may be performed in any of the usual manners. Just prior to the parts reaching the position shown in Fig. 2 the finers H & G are liberated from the control of the cams I and I', and this permits the springs H' and G' to throw the said fingers out of the way of the tube, so that the latter may be readily withdrawn. Furthermore it will be observed that the spring nippers are brought into contact with pins or rods F^3, C^3 insuring their being opened at the proper instant and after they have performed their functions. As soon as these actions have taken place and the tube has been delivered by the delivery rolls S, the parts are returned to their original position shown in Fig. 1.

To insure the proper transverse creasing of the tube, I have before described that the rear edge W of the former plate E creases the paper on the transverse groove w of the bed plate T, and this action remains during the folding operation, but the paper tube is releaased at the completion of the operation by the action of the spring F', lifting the plate E and its arm F vertically and sustaining it in the position shown just at the completion of the reciprocation of the cylinder B. In this manner the transverse crease is positively formed, and at the proper instant the tube is liberated for delivery.

I do not confine myself to the details of construction, as they may be modified in various ways without departing from the invention.

Having now described my invention what I claim as new and desire to secure by letters patent is:

1st: In a paper bag machine, the combination of a rotary reciprocating bed, an oscillating reciprocating former plate adapted to move simultaneously with the bed and operated therewith like a hinge, power devices to simultaneously operate the said bed and also the said plate, and means upon both the bed and plate to hold and crease the bag tube during their movements.

2nd. In a paper bag machine, the combination of a rotary reciprocating bed, an oscillating reciprocating former plate adapted to move simultaneously with the bed and operate therewith like a hinge, power devices to simultaneously operate the said bed and also the said plate, and means upon both the bed and plate to hold the ends of the tube layers so as to open the end of the tube, and folding fingers to crease the bag tube on diagonal lines during their movements.

3rd. In a paper bag machine, the combination of a rotary reciprocating bed, an oscillating reciprocating former plate adapted to move simultaneously with the bed and operate therewith like a hinge, power devices to simultaneously operate both the said bed and former plate, a cam device for holding the rear edge of the former plate from the bed when receiving the bag tube, and clamps upon the forward edges of the bed and former plate to hold the two layers of the tube and separate them during the operation of the said bed and former plate.

4. In a paper bag machine, the combination of a rotary reciprocating bed, an oscillating reciprocating former

plate adapted to move simultaneously with the bed and operate therewith like a hinge, power devices to simultaneously operate both the said bed and former plate, a cam device for holding the rear edge of the former plare from the bed when receiving the bag tube, folding or creasing fingers upon the former plate and bed to enter the bellows side folds of the tube to make the oblique creases or folds, and clamps upon the forward edges of the bed and former plate to hold the two layers of the tube and separate them during the operation of the said bed and former plate.

5. In a paper bag machine, the combination of a rotary reciprocating bed, an oscillating reciprocating former plate adapted to move simultaneously with the bed and operate therewith like a hinge, power devices to simultaneously operate both the said bed and former plate, a cam device for holding the rear edge of the former plate from the bed when receiving the bag tube, clamps upon the forward edges of the bed and former plate to hold the two layers of the tube and separate them during the operation of the said bed and former plate, and means for opening said clamps when the bed and former plate reach the end of their extreme movements.

6. In a paper bag machine, the combination of a rotary reciprocating bed, an oscillating reciprocating former plate adapted to move simultaneously with the bed and operate therewith like a hinge, power devices for reciprocating the bed and former plate simultaneously, feeding devices for feeding the bag tubes between the bed and former plate when at rest, cam devices for holding the bed and former plate separated to

permit the entrance of the tube, and means on the bed and former plate to open the end of the bag tube and properly crease it to assist in forming a satchel bottom bag.

1st. In a paper bag machine, the combination of a rotary reciprocating bed, ~~a reciprocating~~ an oscillating reciprocating former plate adapted to move simultaneously with the bed and operated therewith like a hinge, power devices to simultaneously operate the said bed and also the said plate, and means upon both the bed and plate to hold and crease the bag tube during their movements.

2nd

The ends of the tube layers so as to open the end of the tube

folding fingers to

or diagonal lines

(4 claims of 1)

power devices to simultaneously operate both the said bed and former plate, a cam device for holding the rear edge of the former plate from the bed when receiving the bag tube, ~~and~~ and clamps upon the forward edges of the bed and former plate to hold the two layers of the tube and separate them during the operation of the said bed and former plate

4

folding or creasing fingers upon the former plate and bed to enter the elbows of side folds of the tube to make the ~~diamon~~ oblique creases or folds

5

and means for opening said clamps when the bed and former plate reach the end of their ~~Extre~~ extreme movements

54

(4 claims of 1)

Power devices for reciprocating the bed and former plate simultaneously, feeding devices for feeding the bag tubes between the bed and former plate when abreast, cam devices for holding the bed and former plate separated to permit the entrance of the tube, and means on the bed and former plate to open the end of the bag tube and properly crease it to form a satchel bottom bag.

55

868

706

Case B 2 sheets

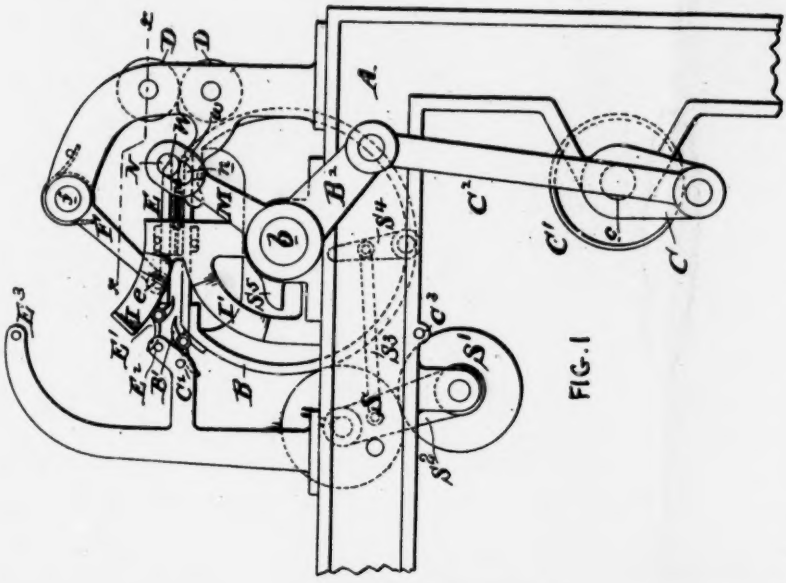


FIG. 1

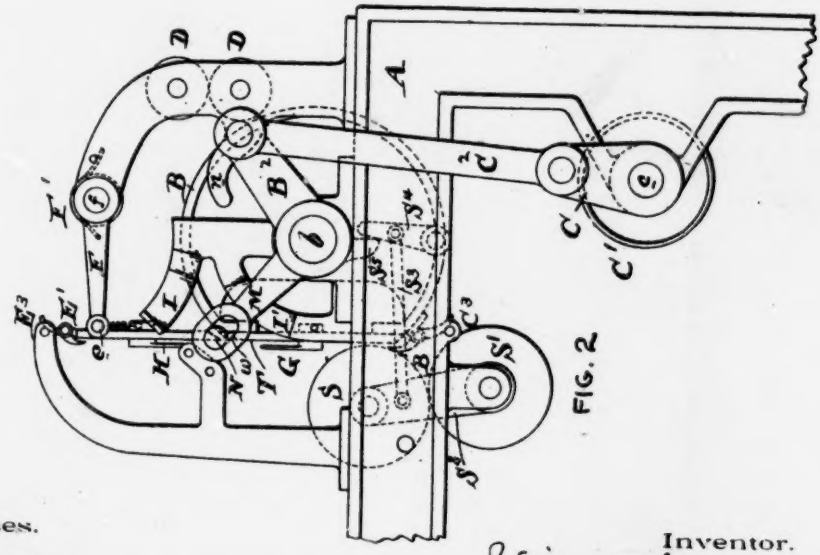


FIG. 2

Witnesses.

Inventor.
William Liddell
By
Attorney

folded backward, so that as the folded tube passes through

Case B. 2 Sheets

Witnesses.

Inventor
William Liddell

By

Attorney.

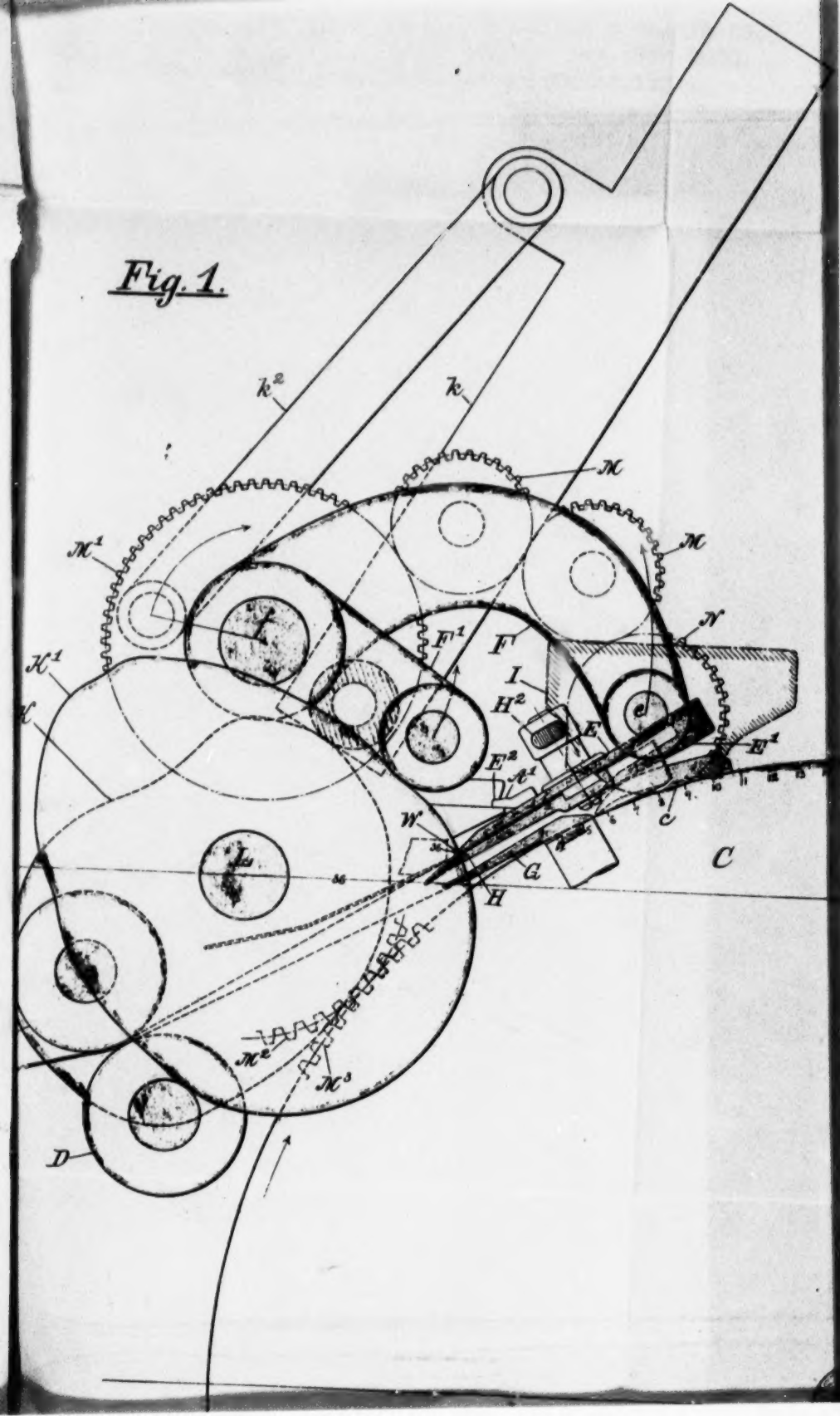


Fig. 1.
k²
k
M
M¹
M
N
K¹
F¹
F
I
H²
E
E¹
E²
A¹
W
C
G
H
M²
M³
D

Liddell Paper Bag Machine.

Forming Plate Operating Parts.

U. S. CIRCUIT COURT,
District of Maine.

EASTERN PAPER BAG CO.
v.
CONTINENTAL PAPER BAG CO.

U. S. CIRCUIT COURT,
District of Connecticut.

EASTERN PAPER BAG CO.
v.
WOODWARD & ROGERS CO.

COMPLAINANT'S EXHIBIT
DRAWING, LIDDELL FORMING-
PLATE OPERATING PARTS.
J.J.C.,
Notary Public,
Nov. 10, 1903.

Fig. 2.

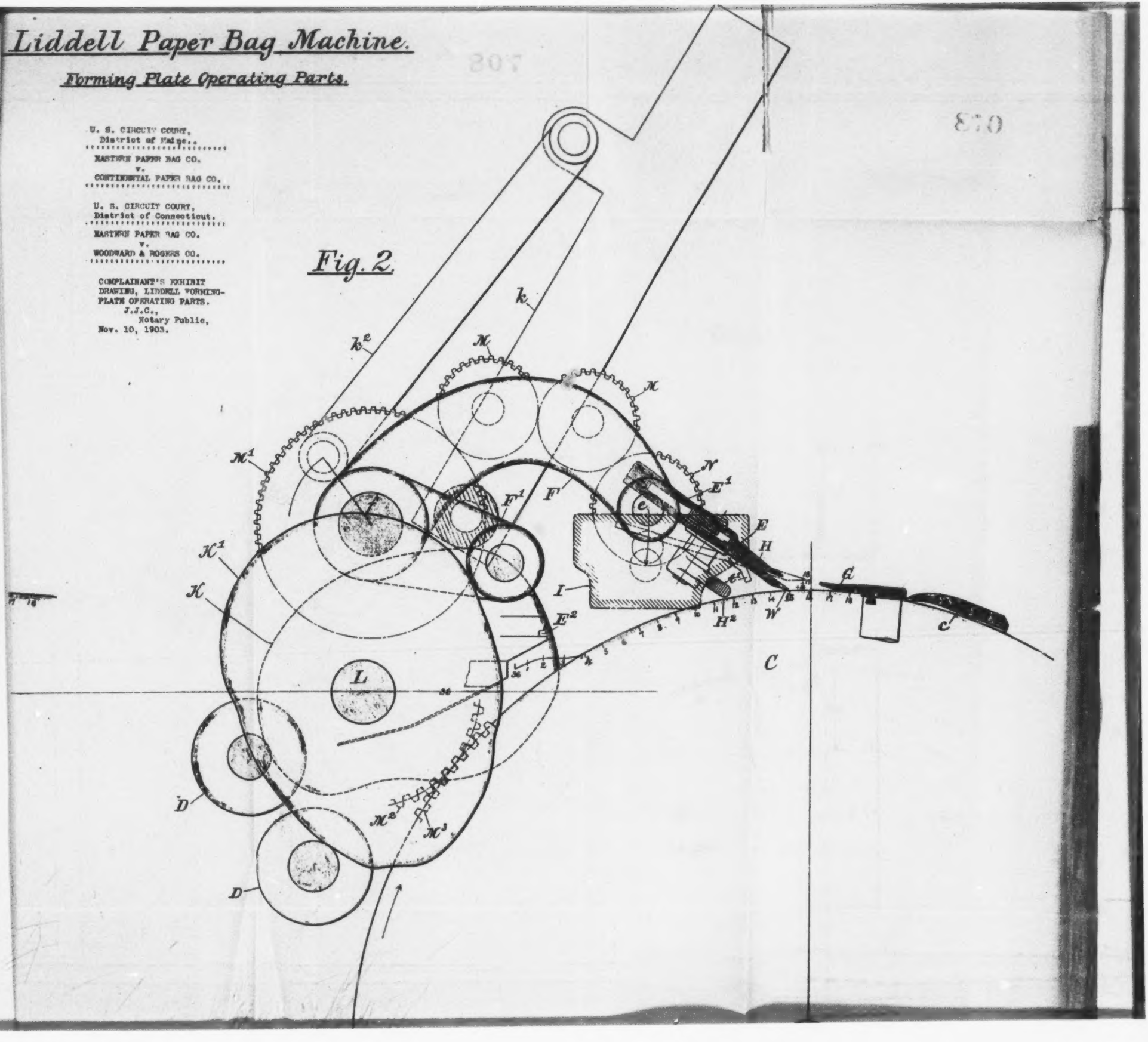
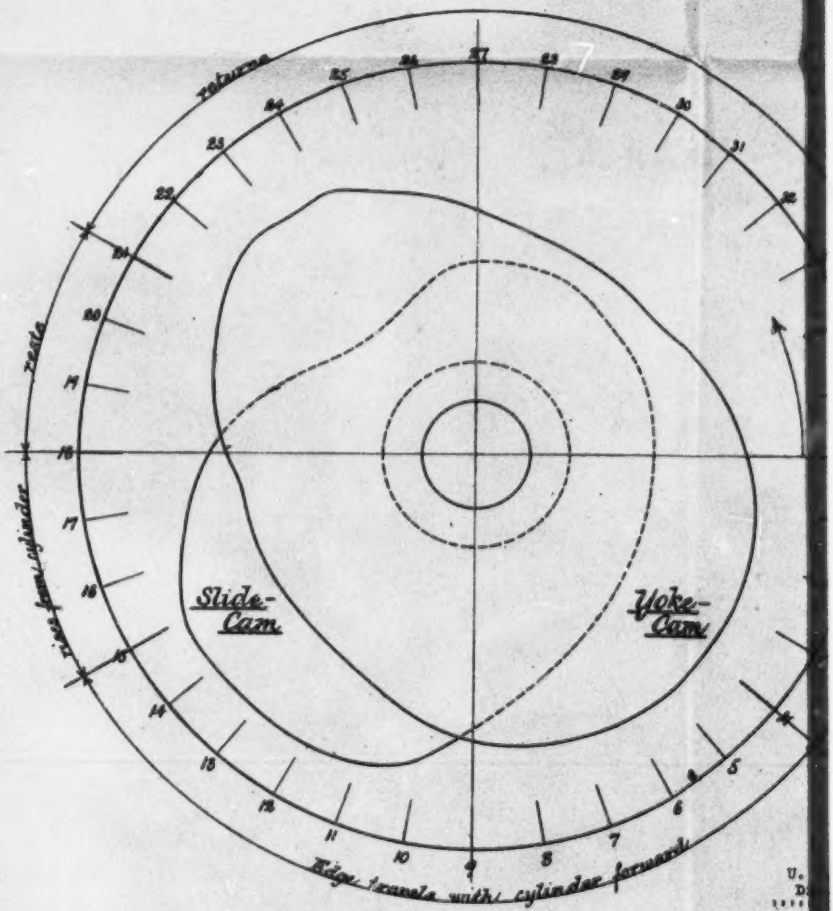


Fig. 1.

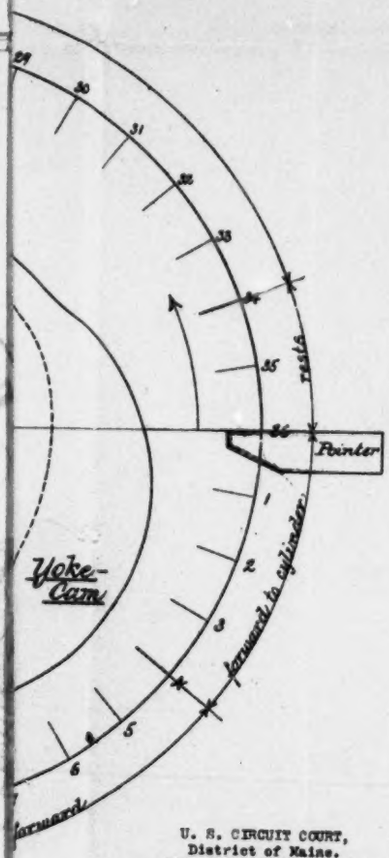
Lidde

Yoke and Slide Cams and graduated Dis



Liddell Paper Bag Machine.

graduated Disc.

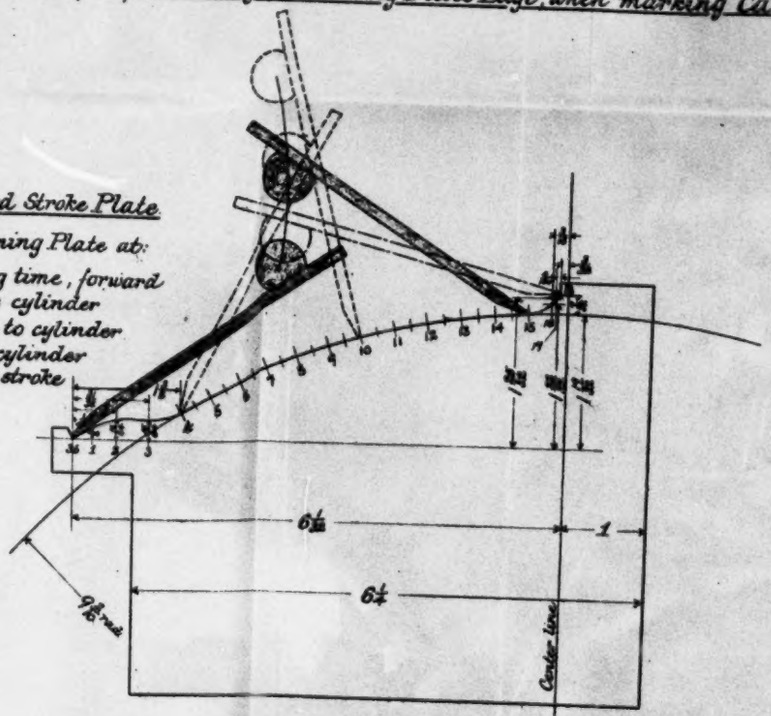


Plates for positioning the Forming Plate Edge, when marking Cams.

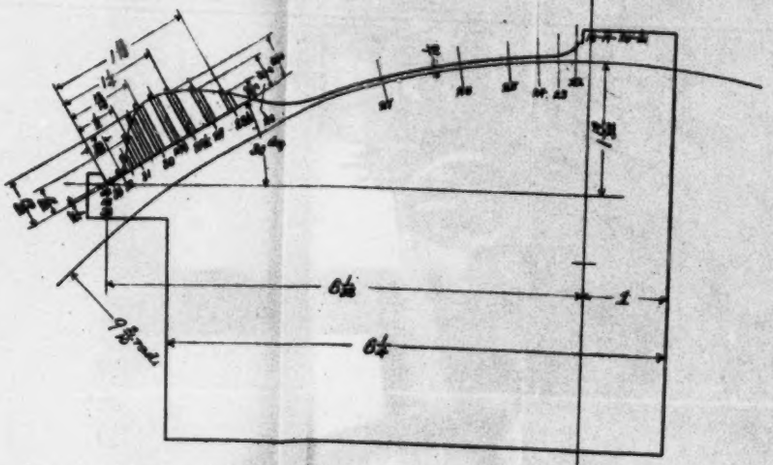
Forward Stroke Plate

showing Forming Plate at:

36 – starting time, forward
4 – reaches cylinder
10 – radial to cylinder
15 – leaves cylinder
18 – end of stroke



Return Stroke Plate.



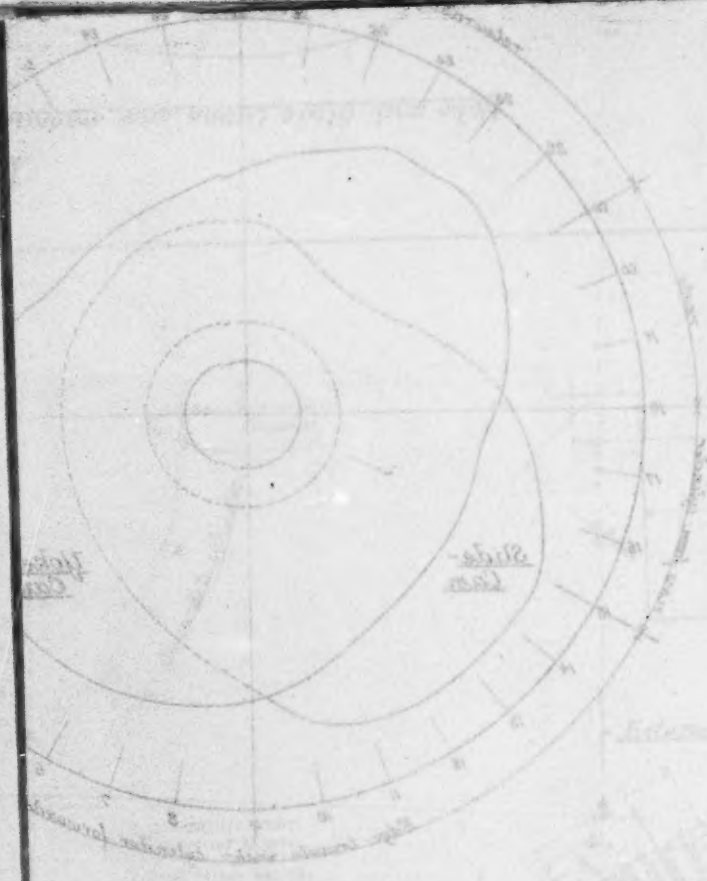
U. S. CIRCUIT COURT,
District of Maine.

EASTERN PAPER BAG CO.
v.
CONTINENTAL PAPER BAG CO

U. S. CIRCUIT COURT,
District of Connecticut.

EASTERN PAPER BAG CO.
v.
WOODWARD & ROGERS CO.

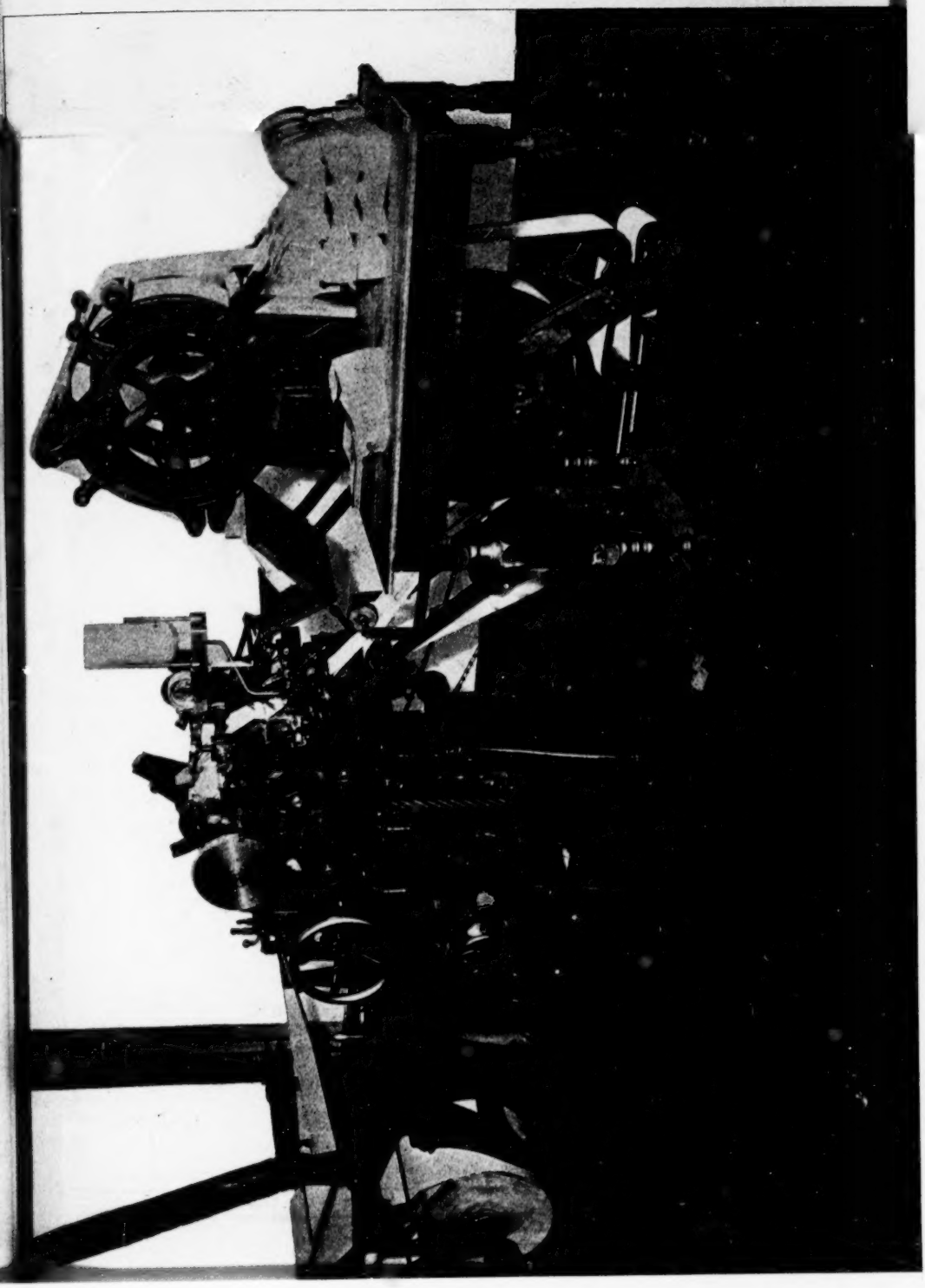
COMPLAINANT'S EXHIBIT
DRAWING, LIDDELL CAM,
DELINEATING DEVICES.
J.J.C.,
Notary Public,
Nov.10,1903.



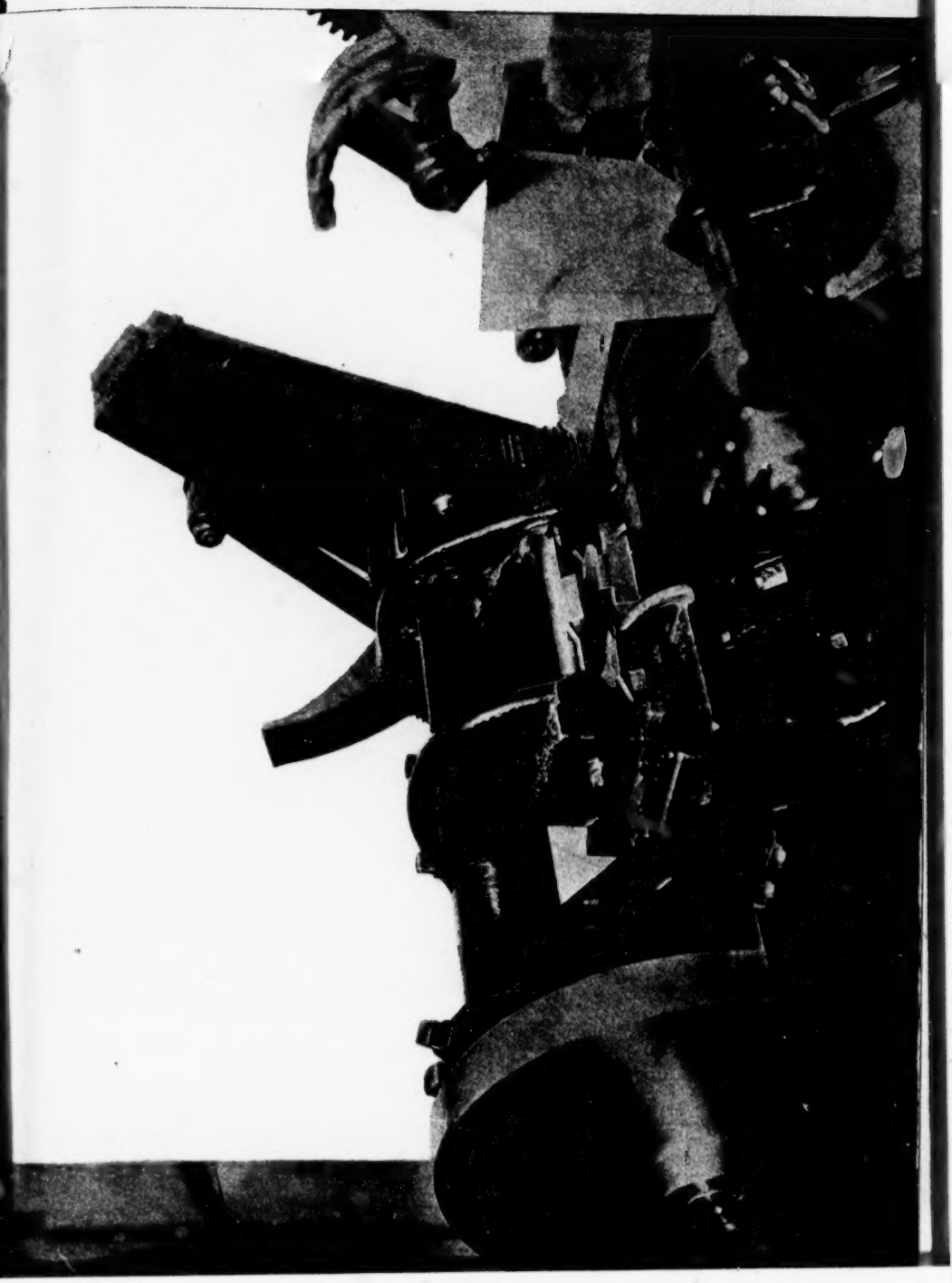
U.S.CIRCUIT COURT, District of Maine.
EASTERN PAPER BAG CO.
v.
CONTINENTAL PAPER BAG CO.

U.S.CIRCUIT COURT, District of Connecticut.
EASTERN PAPER BAG CO.
v.
WOODWARD & ROGERS CO.

COMPLAINANT'S EXHIBIT LIDDELL MACHINE PHOTO. NO. I, J.J.C., Notary Public, Nov.10,1903.



U.S.CIRCUIT COURT, 873 U. S. CIRCUIT COURT, 711
District of Maine. District of Connecticut.
EASTERN PAPER BAG CO., EASTERN PAPER BAG CO.
v. v.
CONTINENTAL PAPER BAG CO. WOODWARD & ROGERS CO.
COMPLAINANT'S EXHIBIT LIDDELL MACHINE PHOTO.
NO. 2,J.J.C.,Notary Public, Nov.10,1903.



U.S.CIRCUIT COURT, 874 U.S.CIRCUIT COURT, 712
District of Maine. District of Connecticut.
EASTERN PAPER BAG CO. EASTERN PAPER BAG CO.
v. v.
CONTINENTAL PAPER BAG CO. WOODWARD & ROGERS CO.
COMPLAINANT'S EXHIBIT LIDDELL MACHINE, PHOTO NO. 3, J.J.C., Notary Public, Nov.10,1903.

U.S.CIRCUIT COURT, 875 U.S.CIRCUIT COURT, 713
District of Maine. District of.Connecticut.
EASTERN PAPER BAG CO. EASTERN PAPER BAG CO.
v. v.
CONTINENTAL PAPER BAG CO. WOODWARD & ROGERS CO.
COMPLAINANT'S EXHIBIT LIDDELL MACHINE PHOTO.
NO. 4,J.J.C.,Notary Public, Nov.10,1903.

U.S.CIRCUIT COURT,
District of Maine.
EASTERN PAPER BAG CO.
v.
CONTINENTAL PAPER BAG CO.

U.S.CIRCUIT COURT,
District of Connecticut.
EASTERN PAPER BAG CO.
v.
WOODWARD & ROGERS CO.

COMPLAINANT'S EXHIBIT LIDDELL MACHINE PHOTO.
NO.5, J.J.C.,Notary Public,Nov.10,1903.

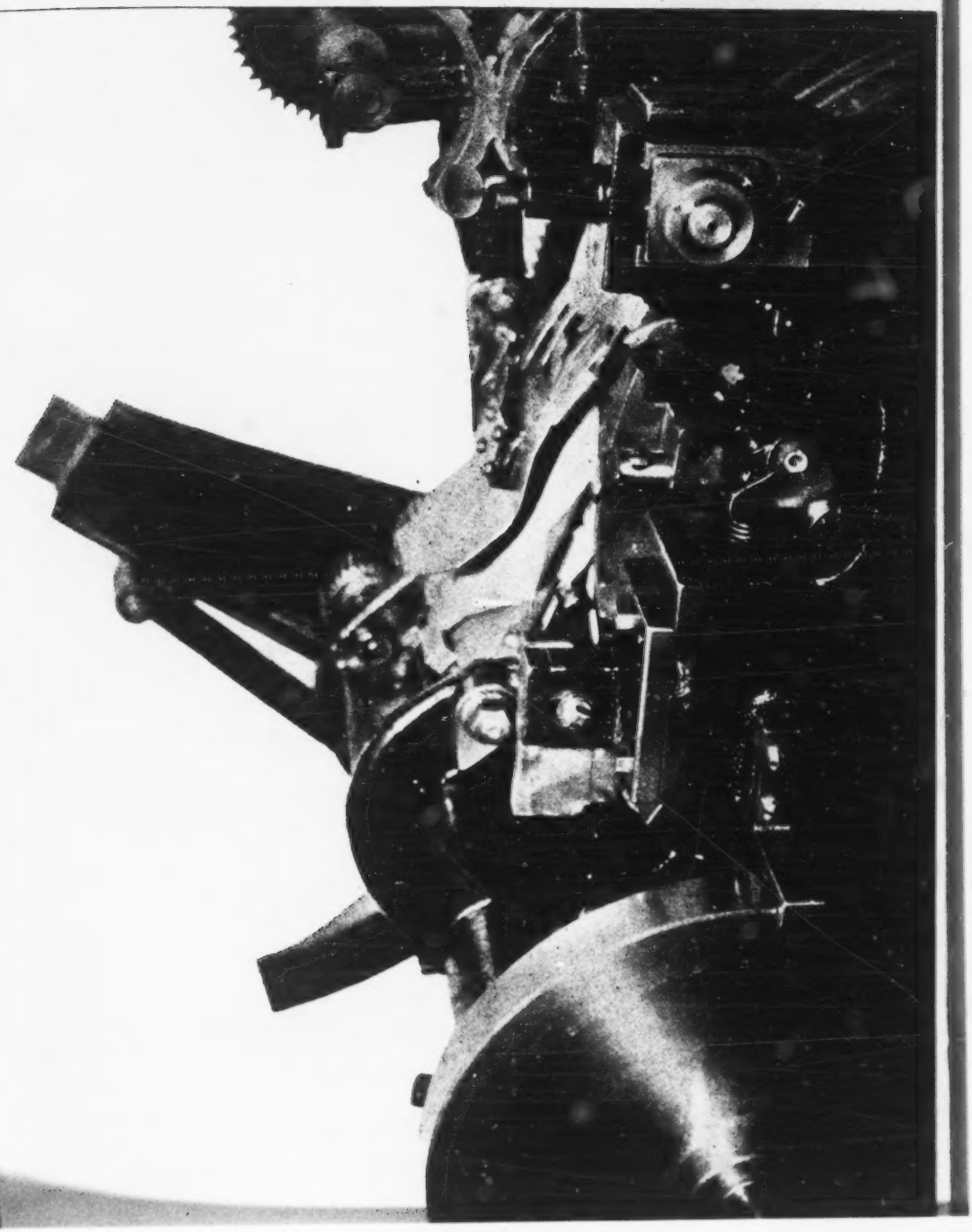


Fig. 1

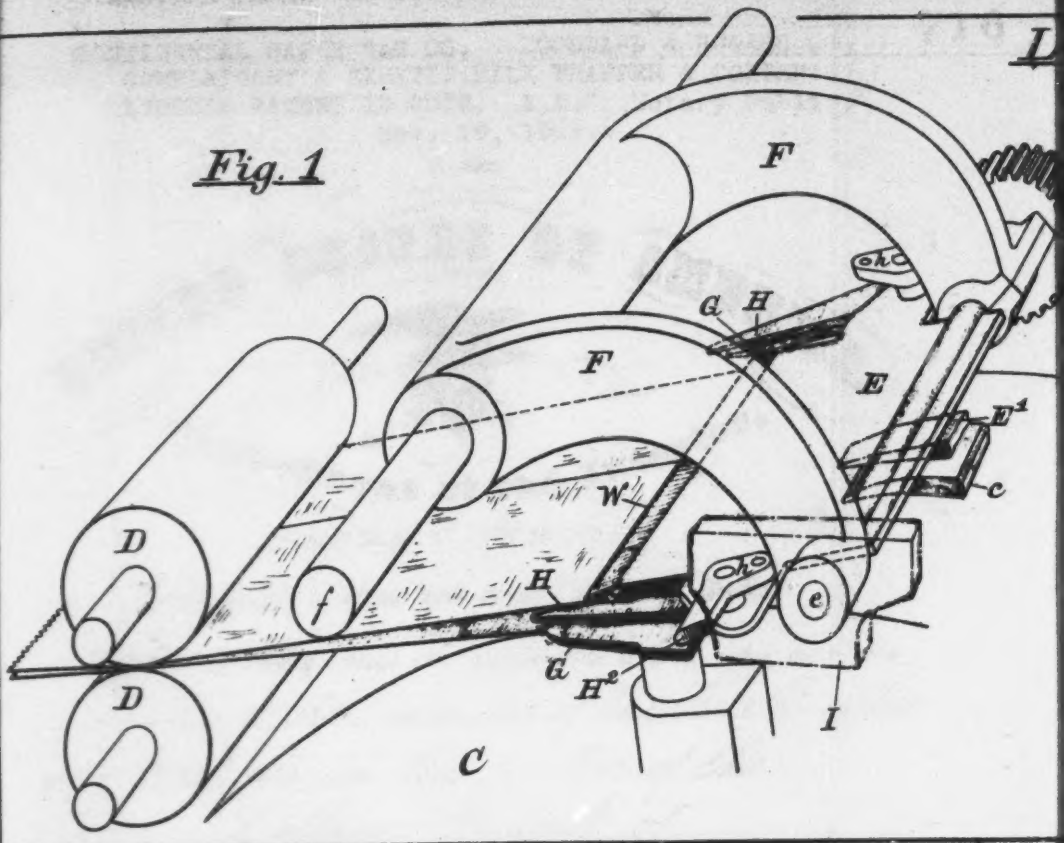
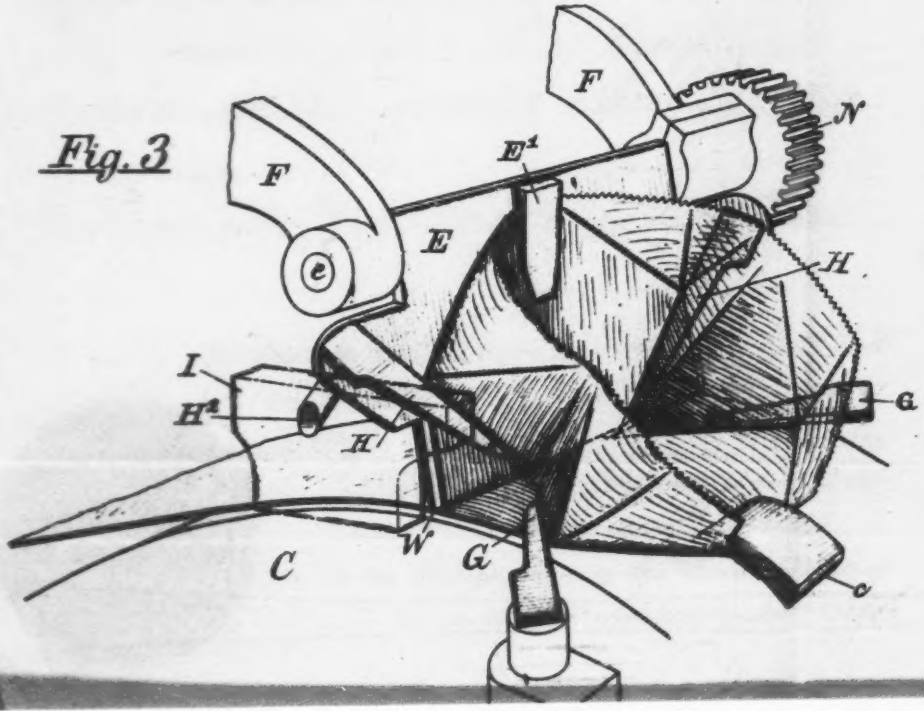


Fig. 3



Liddell Paper Bag Machine. Perspective Drawings of the Forming Plate and co-operating Parts opening out a Diamond.

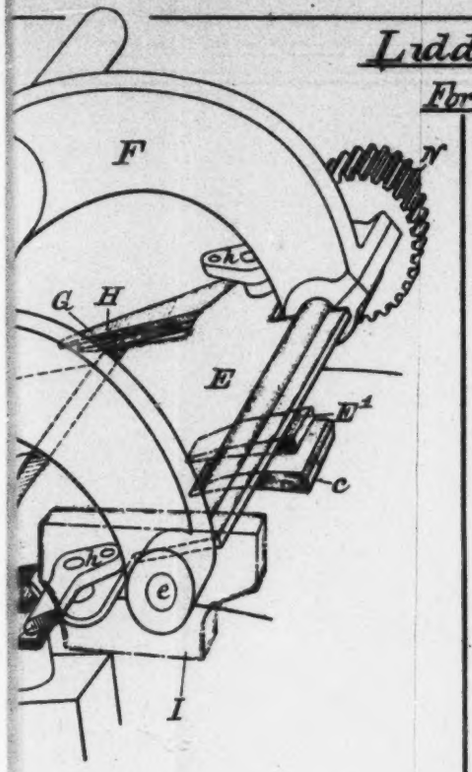
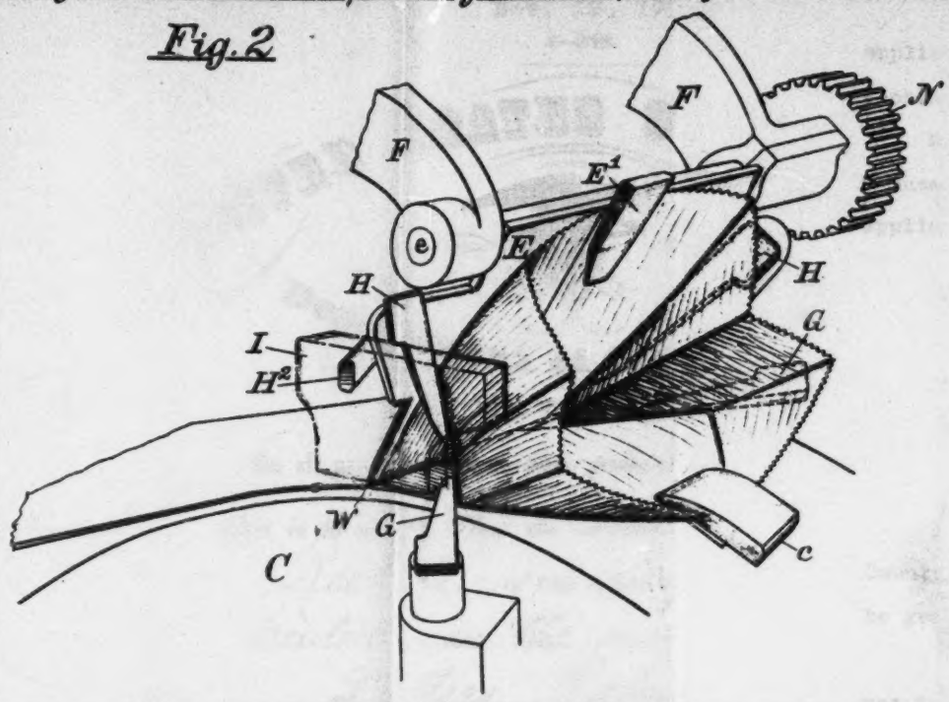


Fig. 2



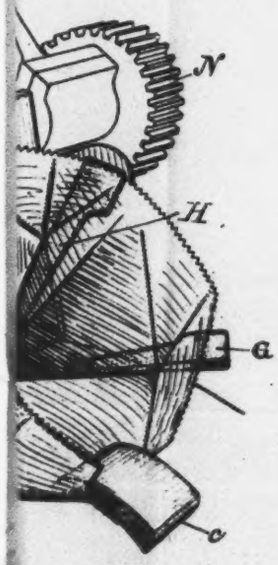
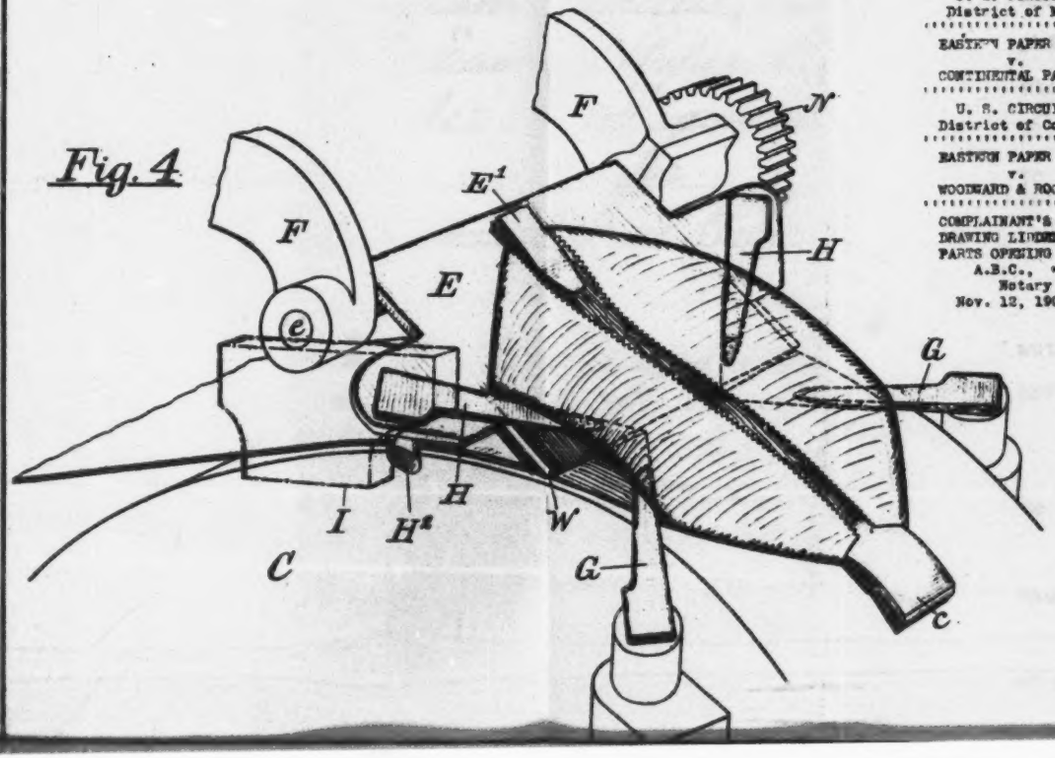


Fig. 4



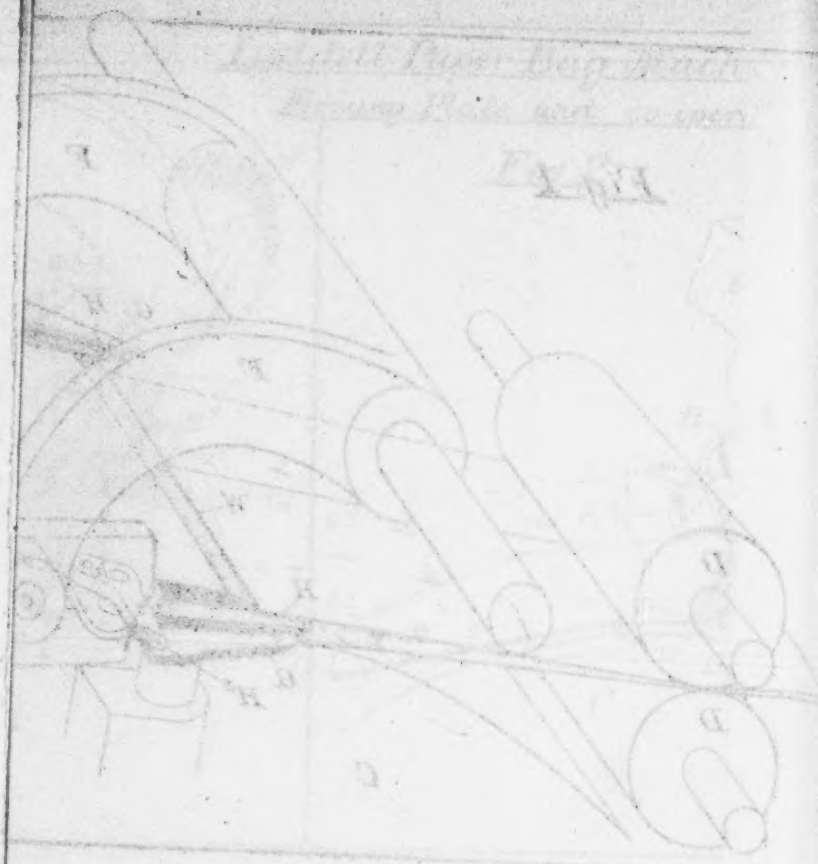
U. S. CIRCUIT COURT,
District of Maine.

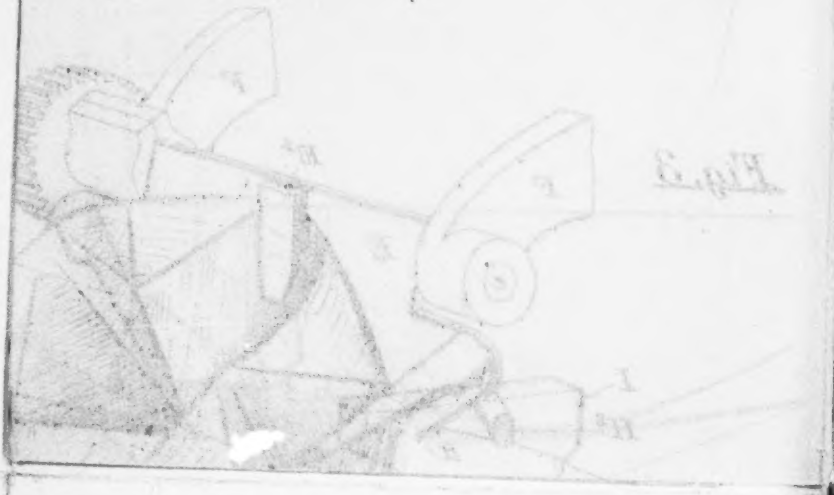
EASTERN PAPER BAG CO.
v.
CONTINENTAL PAPER BAG CO

U. S. CIRCUIT COURT,
District of Connecticut.

EASTERN PAPER BAG CO.
v.
WOODWARD & ROGERS CO.

COMPLAINANT'S EXHIBIT
DRAWING LIDDELL MACHINE
PARTS OPENING DIAMOND.
A.B.C., ,
Notary Public,
Nov. 12, 1903.





U.S.CIRCUIT COURT, 878 U.S.CIRCUIT COURT,
District of Maine. District of Connecticut.
EASTERN PAPER BAG CO. EASTERN PAPER BAG CO.
v. v.
CONTINENTAL PAPER BAG CO. WOODWARD & ROGERS CO. 716
COMPLAINANT'S EXHIBIT, FILE WRAPPER & CONTENTS,
LIDDELL PATENT IN SUIT, A.B.C., Notary Public,
Nov. 19, 1903.

2—389.

UNITED STATES OF AMERICA.

Department of the Interior,

PATENT OFFICE.

To all persons to whom these presents shall come, Greeting:

This is to certify That the annexed is a true copy from the Records of this office of the File Wrapper and Contents, in the matter of the Letters Patent of William Liddell, Assignor to The Eastern Paper Bag Company, Number 558,969 granted April 28, 1896 for Improvement in Paper Bag Machines

In testimony whereof I have hereunto set my hand and caused the seal of the Patent Office to be affixed at the City of Washington this 7th day of February, in the year of our Lord one thousand nine hundred and three and of the Independence of the United States of America the one hundred and twenty-seventh.

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$ 15 — ek
CHIEF CLERK.

17

879

Philadelphia, Pa. Jan 27 1896.

Hon. Commissioner of Patents:

Dear Sir:-- I herewith forward the application of William Liddell for an Improvement in Paper Bag Machine

My check for the first government fee is hereunto annexed. Please advise me at my Philadelphia office of the filing of the application. There are three Sheets of Drawing with the applicatio

Very truly

R M Hunter

Attorney.

Case A.

To the Commissioner of Patents.

Your Petitioner, William Liddell a resident, of Brooklyn County of Kings State of New York prays that Letters Patent may be granted to him for the Improvement in

Paper Bag Machines

set forth in the annexed specification; and does hereby appoint RUDOLPH M. HUNTER, of 926 Walnut Street, in the City of Philadelphia, State of Pennsylvania, his Attorney, with full power of substitution and revocation, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent Office, connected therewith.

Wm Liddell

of hereby authorized to act as Associate Counsel in the matter of this application.

SPECIFICATION.

To all whom it may concern:

Be it known that I, William Liddell of the City of Brooklyn, County of Kings, State of New York have invented an improvement in

Paper Bag Machines

of which the following is a Specification:

My invention has reference to paper bag machines; and it consists of certain improvements which are fully described in the following specification and are shown in the accompanying drawings which form a part thereof.

This application comprehends certain mechanism for forming a satchel bottom upon the tube in the manufacture of paper bags, and has for its object the production of a perfectly formed satchel bottom bag in a speedy and accurate manner. My improvements briefly stated may be described as follows:-

The tube is received upon a revolving cylinder and carried forward by a nipper which clamps the lower sheet of the tube, or by other means hereinafter described. The upper sheet of the tube passes above a finger upon a movable forming-plate securely held at a short distance from the revolving cylinder and between which and the cylinder the tube is guided. The forming plate is then caused to rotate about its rear edge simultaneously with its movement or travel with the revolving cylinder, thereby opening the end of the tube, spreading the side folds and marking a creased line transversely. Simultaneously with this, forming fingers are projected into the side folds, one pair being adapted to the cylinder and the other pair to the forming plate. A continued movement of the parts cause the upper layer or sheet of the tube to be completely turned backward upon itself, and at the same time the forming fingers together with the other parts insure the proper formation of the diamond fold. The tube in this shape leaves the revolving cylinder, passes to the pasting devices and thence to the folder.

The invention will be better understood by reference to the accompanying drawings in which:-

...e of Allowance, Mch. 17, 1896.
Serial No. 578,291

Fig. 1 is a side elevation of a paper bag machine embodying my improvements.

Fig. 2 is a plan view of a portion of the same.

Figs. 3 and 4 are sectional elevations on the line x x of Fig. 2 showing the operations of the parts in the formation of the bottom.

Figs. 5, 6, 7, and 8 are perspective views illustrating the several manipulations which take place upon the bag tube in its formation under the action of the nipper and the forming fingers.

Fig. 9 is a diagram illustrating the employment of a continuous or connected series of tubes to insure their being fed with the cylinder and obviating the necessity of nippers.

Fig. 10 is a plan view of the paper tube employed in connection with Fig. 9.

Fig. 11 is an inverted plan view of same; and

Fig. 12 is a longitudinal section of the tube on line z z.

A is the main frame of the machine.

B is a shaft carried upon the main frame and upon which is supported the forming cylinder C which may be provided with one or more nippers c adapted to be closed and held closed by the action of the spring c', and opened by the action of a pin C^2 acting upon the star wheel C'. The nipper is also controlled as to its being closed by the action of the pin C^3 also acting upon the star wheel. These devices operate to enable the nipper to close upon the forward edge of the under layer of the bag tube, and after the formation or creasing of the bottom into the diamond folds, to release the bag tube.

D D are two feed or guide rollers adapted to properly deliver the bag to the cylinder C.

E is a forming plate and is hinged at e to the arm F journalled to the main frame at f. This arm F is drawn toward the cylinder C by a spring F' and is moved away from the cylinder about the axis f by cam K' and arm F'.

L is a rotating power shaft carrying cam and is driven by a belt pulley L' and operates the cylinder C by gears M^2 M^3. Spur gears M' M N operate the axis e of the forming plate E when the arm F is moved. Of these gears M' is substantially fixed, and hence when the arm F is moved, its gears M work upon gear M' as if it were a rack. This causes motion to the plate E about e as an axis.

As the motion of the arm F is irregular and not always in the same direction for one continuous movement of the former plate E, I cause the gear M' to be moved somewhat to compensate for this. On the shaft L I arrange a cam K which acts upon a rod k to reciprocate it, and this by link k^2 rocks the gear or rack M'. The cams K and K' insure a proper return movement of the arm F and former plate E, and in time with the rotations of the cylinder C. In place of these devices for controlling the movement of the plate E relatively to the cylinder C, the said plate may be moved or operated by any other suitable means. The return movement of the plate E is unimportant, so long as it is secured in time to receive a new bag tube or section thereof.

The cylinder C has pivoted upon its periphery fingers G G which are normally out of the line of the bag tube, but which may be projected inwardly by the action of a cam I' secured to the main frame A. The fingers G G are connected together by arms g and a link G' arranged in the under side of

the cylinder surface, and one of them is further provided with an arm G^2 adapted to come in contact with the cam I' during the rotation of the cylinder and thus cause cause said fingers to be projected inward as indicated in dotted lines in Fig. 2 so as to enter the bellows side folds of the tube. The former plate E has its rear edge made sharp as at W so that when it presses downward upon the bag tube it forms a transverse crease about which the paper bends as clearly shown in Figs. 4 and 6. This former plate E is also provided with fingers H H corresponding to the fingers G G which are connected by arms h and link H' precisely as are connected to the fingers G G, and are operated by means of a spring J in one direction to hold them out of action, and a stationary cam I acting upon an arm or projection H^2 to move them inward or in the other direction so that they enter the bellows side folds precisely as at the fingers G G. Stops J' limit their movement in one direction.

The rear or free end of the former plate E is provided with eyes E^2 which are received upon projections A', as clearly shown in Fig. 3 so as to be maintained out of the line of the bag tube in entering between the said plate and the cylinder C after it has been caught by the nipper c and moved forward. When the bag tube is moved to the position shown in Fig. 3, the upper layer of the paper is moved over a finger E' arranged adjacent to the axis e and below the former plate E. As the plate E is moved forward with the bag tube, the eye E^2 leaves the projection A', as shown in Fig. 4, and the edge W presses down upon the paper forming a line or crease. It will also be observed that as this takes place the fingers G, upon each side at their free ends are brought more or less to

gether and at the same time the finger E' moves away from the nipper c, opening the bellows side folds as indicated in Fig. 4. This permits the ready entrance of the fingers G H under the action of the cams I', I, and these fingers continue to maintain their position during the successive formative actions of the machine. As the cylinder C moves forward, the plate E rotates upon its own axis c and also about edge W as an axis as indicated in Figs. 6, 7 and 8, which action is so timed that the several fingers G, H, nippers g and finger E' operate to form the several actions upon the tube substantially in the manner as indicated in Figs. 2 to 8. As this folding action is completed, the fingers G, H quickly fly out of the folds of the tubes when their arms G^2 H^2 lift the cams I', I, and the bag in its folded condition is still held by the nipper c and carried forward with the cylinder C. It is then delivered to the rolls S, having pins s, thence to the paste rolls Q, T, of which Q applies the paste after having received it from the rolls P, P, and vat O. The bottom is then folded by the knife r which folds the paper upon itself between pressure rolls R, R. It is quite evident that the delivery, paste and subsequent folding devices may be made in any of the well known manners, and their particular construction as immaterial to my invention. I do not, therefore, deem it necessary to describe the minute details of these devices, but illustrate them as to show their relative position in a machine of the class described.

When the cylinder C advances sufficiently to deliver the bag to the feed rolls S, the star wheel reaches the pin C^2 and opens the nipper c to release the paper bag, and the said nipper remains open until it reaches the pin C^3 which closes the

nipper upon another bag tube. I have shown two such nippers and their operating mechanism, and it is evident that so far as my improvements are concerned one or more of these devices may be employed by simply reducing or enlarging the diameter of the cylinder C maintaining its surface speed the same.

As soon as the tube has been withdrawn from the plate E the said plate is caused to return to its original position, by the operation of the arm F cams and gears so that it shall be in the proper position to receive the next paper tube. As before explained, the gear M' is in effect substantially a rack, but moved by cam K, and as the arm F is oscillated about f as a center by cam K' the intermediate gear M, and gear N causes a proper rotation or oscillation of the plate E about e as a center. The movements of the arm F are governed by the cam K' and arm F', and is so timed that while permitting the rotation or oscillation of the plate E about its axis e, it insures the edge W moving exactly at the same speed of the surface speed of the cylinder C so as not to displace in any manner the tube.

While I have shown the nippers upon the cylinder C, they are not necessary, as the paper tube may be severed into bag tube sections W Fig. 10, but left connected by short connections w Fig. 11 so that it is in effect pulled by itself about cylinder C under the action of the rolls S'. The rollers S' may be cutting rolls which while drawing the tube section through sever the bag tube sections before they go to the pasting devices. This method of operating is indicated in Fig. 9. It willbe observed that as the tube is bent over the cylinder C the upper layer will rise and pass above the finger E' of the former plate E.

In this case the bag tube will have the diamond folds made upon the tube while still connected together. It will thus be seen that is is not necessary to employ the nippers upon the cylinder C, though it may be more desirable to use them.

It is evident that the mere mechanism for securing the several movements to the different parts may be modified or changed in various ways without departing from the spirit of the invention, and I do not, therefore, confine myself to the details of construction here shown.

What I claim as new and desire to secure by letters patent, is:

1. In a paper bag machine, the combination of a rotating cylinder provided with one or more pairs of side folding fingers adapted to be moved toward or from each other, a forming-plate also provided with side forming fingers adapted to be moved toward or from each other, means for operating said fingers at definite times during the formative action upon the bag tube, operating means for the forming plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder, the whole operating for the purpose of opening and forming the bottom of the bag tube, and means to move the bag tube with the cylinder.

2. In a paper bag machine, the combination of the rotating cylinder provided with one or more pairs of side folding fingers adapted to be moved toward or from each other, a forming plate also provided with side forming fingers adapted to be moved toward or from each other, means for operating said fingers at definite times during the formative action upon the bag tube, operating means for the forming plate adapted to

cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder for the purpose of opening and forming the bottom of the bag tube, a finger moving with the forming plate for receiving the upper sheet of the tube and lifting it during the formative action, power devices for returning the forming plate to its original position to receive a new bag tube, and means to move the bag tube with the cylinder.

3. In a paper bag machine, the combination of the rotating cylinder provided with one or more pairs of side folding fingers adapted to be moved toward or from each other, a forming plate also provided with side forming fingers adapted to be moved toward or from each other, means for operating said fingers at definite times during the formative action upon the bag tube, operating means for the forming plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder for the purpose of opening and forming the bottom of the bag tube, a finger moving with the forming plate for receiving the upper sheet of the tube and lifting it during the formative action, power devices for returning the forming plate to its original position to receive a new bag tube, means to sustain the rear of the forming plate clear of the surface of the revolving cylinder so as to permit the proper entrance of the paper bag between the former plate and the surface of the cylinder, and means to move the bag tube with the cylinder.

4. In a paper bag machine, the combination of the rotating cylinder provided with one or more pairs of side folding fingers adapted to be moved toward or from each other, a forming plate also provided with forming side fingers

adapted to be moved toward or from each other, means for operating said fingers at definite times during the formative action upon the bag tube, operating means for the forming plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder for the purpose of opening and forming the bottom of the bag tube, means to sustain the rear of the forming plate clear of the surface of the revolving cylinder so as to permit the proper entrance of the paper bag between the former plate and the surface of the cylinder, and means to move the bag tube with the cylinder.

5. In a paper bag machine, the combination of a rotating cylinder provided with one or more nippers, power devices for opening and closing the nippers at predetermined intervals of time, pivoted side forming fingers G G carried upon the surface of the cylinder and upon each side thereof so as to receive the bag tube between them, power devices for operating the fingers G, G at definite times during their movement forward with the cylinder, a forming plate E also provided with side forming fingers H H adapted to be brought into alignment above the fingers G G in the preliminary operation of forming the bag, a movable frame to which said forming plate is hinged, power devices for moving said movable frame, power devices for oscillating the said forming plate upon the movable frame so that its rear edge travels in conjunction with and at the same rate of speed as the cylinder, and means for operating the forming fingers of the former plate.

6. In a paper bag machine, the combination of a rotating cylinder provided with one or more nippers, power devices for opening and closing the nippers and predetermined intervals of

time, pivoted forming fingers G G carried upon the surface of the cylinder and upon each side thereof so as to receive the bag tube between them, power devices for operating the finger G G at definite times during their movement forward with the cylinder, a forming plate E also provided with the forming fingers H H adapted to be brought into alignment above the fingers G G in the preliminary operation of forming the bag and also provided with a finger rearwardly extending at its forward end for separating the upper layer of the bag tube when opening the same during the oscillation of the plate, a movable frame to which said forming plate is hinged, power devices for moving said movable frame, power devices for oscillating the said forming plate upon the movable frame so that its rear edge travels in conjunction with and at the same rate of speed as the cylinder, and means for operating the forming fingers of the forming plate.

7. In a paper bag machine, the combination of the rotating cylinder for the bag tube provided with one or more pairs of folding fingers adapted to be moved toward or from each other, a forming plate also provided with forming fingers adapted to be moved toward or from each other, means for operating said fingers at definite times during the formative action upon the bag tube, operating means for the forming plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder for the purpose of opening and forming the bottom of the bag tube, and connecting mechanism for timing the movements of the rotating cylinder and the forming plate.

8. In a paper bag machine, the combination of a rotating

cylinder provided with one or more nippers, power devices for opening and closing the nippers and predetermined intervals of time, pivoted forming fingers G G carried upon the surface of the cylinder and upon each side thereof so as to receive the bag tube between them, power devices for operating the fingers G, G at definite times during their movement forward with the cylinder, a forming plate E also provided with forming fingers H H adapted to be brought into alignment above the fingers G G in the preliminary operation of forming the bag, a movable frame to which said forming plate is hinged, power devices for moving said movable frame, power devices for oscillating the said forming plate upon the movable frame so that its rear edge travels in conjunction with and at the same rate of speed as the cylinder, means for operating the forming fingers of the forming plate, and connecting devices for timing the movements of the movable frame the former plate and the rotating cylinder.

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In Testimony of which Invention, I have hereunto set my hand

Witnesses:

R.M.Hunter

Wm Liddell

Ernest Howard Hunter

State of Pennsylvania)
)ss. 891
County of Philadelphia)

William Liddell,

the above named petitioner citizen of the United States, and resident of Brooklyn in the County of Kings and State of New York being duly sworn, deposes and says that he verily believes himself to be the original, first, and sole inventor of the improvement in

Paper Bag Machines

described and claimed in the foregoing specification; that the same has not been patented to, him or to others with his knowledge or consent, in any country that the same has not to his knowledge been in public use or on sale in the United States for more than two years prior to this application, and he does not know and does not believe that the same was ever known or used prior to his invention thereof

Wm Liddell

Sworn to and subscribed before me this seventh day of January 1896.

(Notarial Seal.) Ernest Howard Hunter

" Notary Public.

Philadelphia Jan. 31, 1896.

Hon. Commissioner of Patents,

Washington, D. C.

Dear Sir:-

Will you kindly return to me the drawings not signed and not witnessed in re application of Wm.Liddell for improvement in Paper Bag Machine.

Very truly,

(R.M.H.) R M Hunter

Ret'd. Feby 4/94

898

UNITED STATES PATENT OFFICE

Issue Division. 2—181. Serial No. 578291

All communications should be addressed to "The Commissioner of Patents, Washington, D. C."

DEPARTMENT OF THE INTERIOR,

892

U. S. Patent Office,

Washington, D. C., March 27, 1896

William Liddell
c/o R M Hunter
926 Walnut St
Phila. Pa.

SIR:—Your APPLICATION for a patent for an IMPROVEMENT IN

Paper Bag Machines

Filed Feb 6' 96., has been examined and ALLOWED.

The final fee, Twenty Dollars, must be paid, and the Letters Patent bear date as of a day not later than SIX MONTHS from the time of this present notice of allowance.

If the final fee is not paid within that period the patent will be withheld, and your only relief will be by a renewal of the application, with additional fees, under the provisions of Section 4897, Revised Statutes. The Office aims to deliver patents upon the day of their date, and on which their term begins to run; but to do this properly applicants will be expected to pay their final fees at least TWENTY DAYS prior to the conclusion of the six months allowed them by law. The printing, photolithographing, and engrossing of the several patent parts, preparatory to final signing and sealing, will consume the intervening time, and such work will not be done until after payment of the necessary fees.

When you send the final fee you will also send, DISTINCTLY AND PLAINLY WRITTEN, the name of the INVENTOR and TITLE OF INVENTION AS ABOVE GIVEN, DATE OF ALLOWANCE (which is the date of this circular), DATE OF FILING, and, if assigned, the NAMES OF THE ASSIGNEES.

If you desire to have the patent issue to ASSIGNEES, an assignment containing a REQUEST to that effect, together with the FEE for recording the same, must be filed in this Office on or before the date of payment of final fee.

Additional copies of Specifications and Drawings will be charged for at the following rates: Single Copies, uncertified, 10 cents each. The money should accompany the order.

Very respectfully,

John S. Seymour

C. A. Brett

Commissioner of Patents.

After allowance, and prior to payment of the final fee, applicants should carefully scrutinize the description to see that their statements and language are correct, as mistakes not incurred through the fault of the office, and not affording legal grounds for reissue, will not be corrected after the delivery of the letters patent to the patentee or his agent.

IN REPLY PLEASE REFER TO SERIAL NUMBER AT THE HEAD OF THIS NOTICE

Note.—If payment is made by check or draft, the credit allowed is subject to the collection of the same.

AMOUNT RECEIVED
$20.—
CHIEF CLERK.

Philadelphia, Pa. Apr. 2, 1896.

Hon. Commissioner of Patents:

Dear Sir:--Herewith annexed I forward you my check for twenty dollars, the amount of the final fee in the application specified below.

Inventor, William Liddell

Patent to be issued to Assignee

Invention, Paper Bag Machines

Date of Filing. Feb. 6th 1896.

731

893

Case A. Div 17

(Serial Number,) 578291 1896. (Ex'r's Book,) 172/111

Patent No. 558,969

William Liddell.,

Assor. to The Eastern Paper Bag Company, (Corp. of Conn.)

Of Brooklyn,

County of . . .

State of New York

Invention Paper Bag Machine

Parts of application filed.

(Petition Jan. 28, 1896.

(Affidavit " " "

(Specification " " "

(Drawing 3 shts, Feb. 6, "

(Model None

(Specimen

(First fee Cash $15, Jan. 28, '96.

(" " Cert.

App. filed complete Feb. 6 - 96

Examined E S Henry Asst. in chg. Mah 14 1896

Countersigned: J W Babson
3-17-96. For Commissioner.

Notice of allowance March 17, 1896.

Final fee Cash $20, April 3 , 1896.

" " Cert. , 189 .

Patented April 28, 1896.

R. M. Hunter,

926 Walnut St.

" Philadelphia, Pa.

804

1896.

CONTENTS:

½ Application 1 papers. OK

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15. 93. PAPER MANUFACTURES,
16. BAG MACHINES,
17. Tube Openers,
18. Roll.
19.
20.
21.
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23.

TITLE:

Improvement in Paper Bag Machines.

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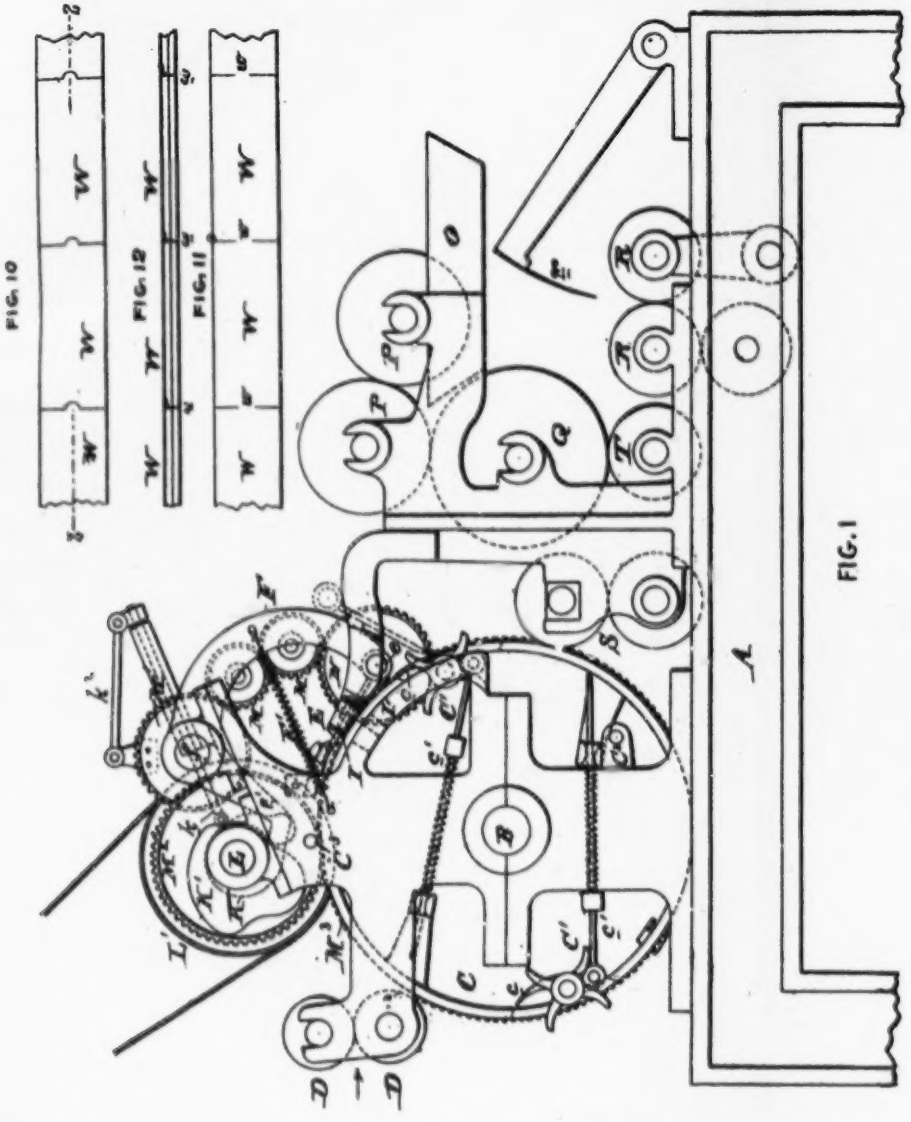
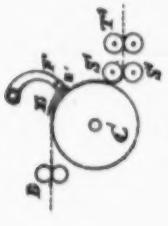
(No Model.) 3 Sheets—Sheet 1.

W. LIDDELL.

PAPER BAG MACHINE.

No. 558,969. Patented Apr. 28, 1896.





Witnesses.

Henry Dumy

Wm. L. Evans

Inventor.

William Liddell

By Wm. L. Evans & Co.

Attorney.

606

(No Model.) 3 Sheets—Sheet 2.

W. LIDDELL.

PAPER BAG MACHINE.

No. 558,969. Patented Apr. 28, 1896.

FIG. 2.

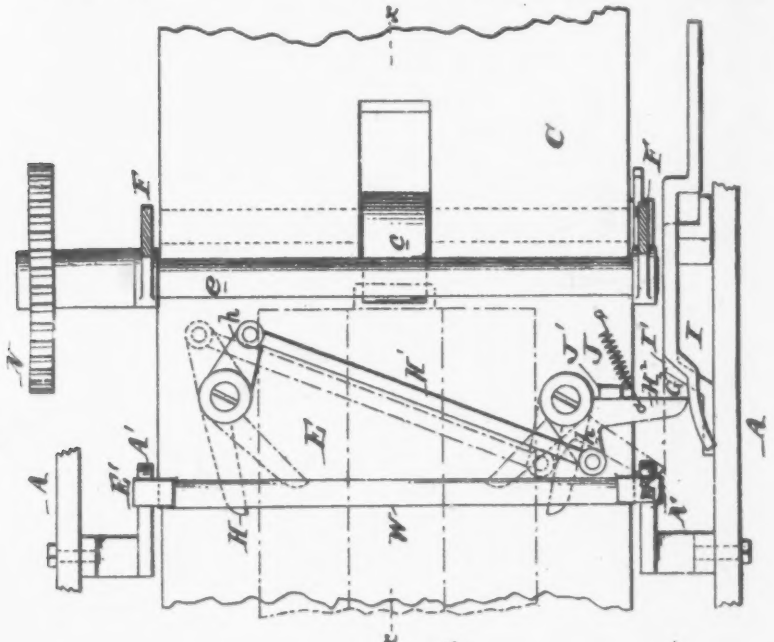


FIG. 3

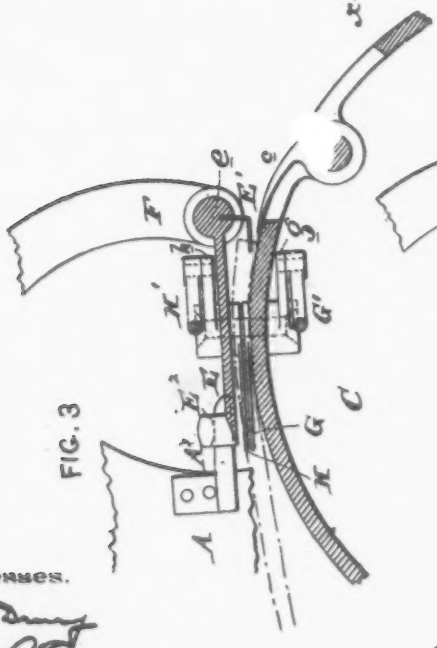
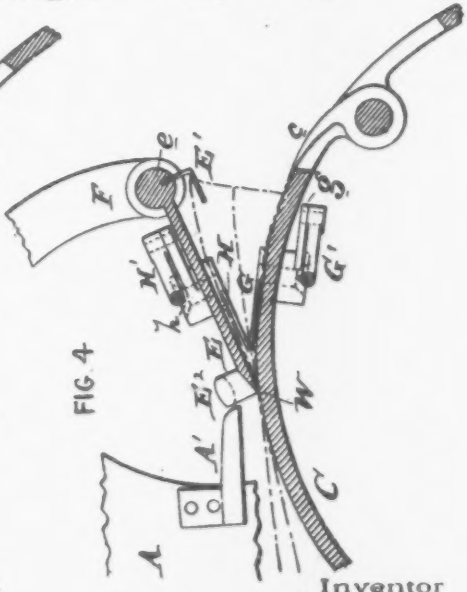


FIG. 4



Witnesses.

Henry Dewey

Wm. L. Evans

Inventor

William Liddell

By F. F. Dewey & Co.

Attorney

(No Model.) 3 Sheets—Sheet 3.

W. LIDDELL.

PAPER BAG MACHINE.

No. 558,969. Patented Apr. 28, 1896.

FIG. 5.

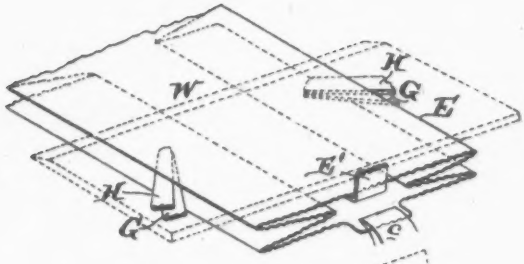


FIG. 6.

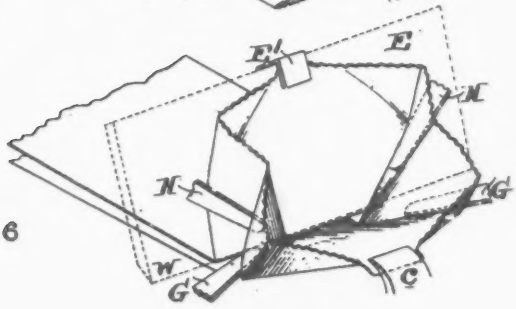


FIG. 7.

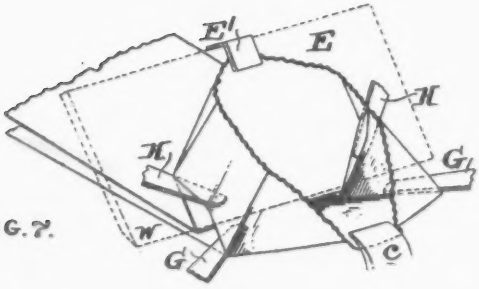
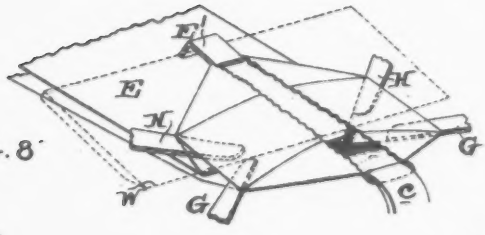


FIG. 8.



Witnesses.

Inventor.

William Liddell

By

Attorney.

ylvania)
)ss.
adelphia)

UNITED STATES PATENT OFFICE.

WILLIAM LIDDELL, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE EASTERN PAPER BAG COMPANY, OF CONNECTICUT.

PAPER-BAG MACHINE.

SPECIFICATION forming part of Letters Patent No. 558,969, dated April 28, 1896.

Application filed February 6, 1896. Serial No. 578,291. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM LIDDELL, of the city of Brooklyn, county of Kings, State of New York, have invented an Improvement in Paper-Bag Machines, of which the following is a specification.

My invention has reference to paper-bag machines; and it consists of certain improvements which are fully described in the following specification and are shown in the accompanying drawings, which form a part thereof.

This application comprehends certain mechanism for forming a satchel bottom upon the tube in the manufacture of paper bags, and has for its object the production of a perfectly-formed satchel-bottom bag in a speedy and accurate manner. My improvements, briefly stated, may be described as follows: The tube is received upon a revolving cylinder and carried forward by a nipper, which clamps the lower sheet of the tube, or by other means hereinafter described. The upper sheet of the tube passes above a finger upon a movable forming-plate securely held at a short distance from the revolving cylinder and between which and the cylinder the tube is guided. The forming-plate is then caused to rotate about its rear edge simultaneously with its movement or travel with the revolving cylinder, thereby opening the end of the tube, spreading the side folds, and marking a creased line transversely. Simultaneously with this forming-fingers are projected into the side folds, one pair being adapted to the cylinder and the other pair to the forming-plate. A continued movement of the parts causes the upper layer or sheet of the tube to be completely turned backward upon itself, and at the same time the forming-fingers together with the other parts insure the proper formation of the diamond fold. The tube in this shape leaves the revolving cylinder, passes to the pasting devices, and thence to the folder.

The invention will be better understood by reference to the accompanying drawings, in which—

Figure 1 is a side elevation of a paper-bag machine embodying my improvements. Fig. 2 is a plan view of a portion of the same. Figs. 3 and 4 are sectional elevations on the line *x x* of Fig. 2, showing the operations of the parts in the formation of the bottom. Figs. 5, 6, 7, and 8 are perspective views illustrating the several manipulations which take place upon the bag-tube in its formation under the action of the nipper and the forming-fingers. Fig. 9 is a diagram illustrating the employment of a continuous or connected series of tubes to insure their being fed with the cylinder and obviating the necessity of nippers. Fig. 10 is a plan view of the paper tube employed in connection with Fig. 9. Fig. 11 is an inverted plan view of same, and Fig. 12 is a longitudinal section of the tube on line *z z*.

A is the main frame of the machine.

B is a shaft carried upon the main frame and upon which is supported the forming-cylinder C, which may be provided with one or more nippers *c*, adapted to be closed and held closed by the action of the spring *c'*, and opened by the action of a pin C^2, acting upon the star-wheel C'. The nipper is also controlled as to its being closed by the action of the pin C^2, also acting upon the star-wheel. These devices operate to enable the nipper to close upon the forward edge of the under layer of the bag-tube, and after the formation or creasing of the bottom into the diamond folds to release the bag-tube.

D D are two feed or guide rollers adapted to properly deliver the bag to the cylinder C.

E is a forming-plate and is hinged at *e* to the arm F, journaled to the main frame at *f*. This arm F is drawn toward the cylinder C by a spring F', and is moved away from the cylinder about the axis *f* by cam K' and arm F'.

L is a rotating power-shaft carrying cam and is driven by a belt-pulley L' and operates the cylinder C by gears M^2 M^3. Spur-gears M' M N operate the axis *e* of the forming-plate E when the arm F is moved. Of these gears M' is substantially fixed, and hence when the arm F is moved its gears M work upon gear M' as if it were a rack. This causes motion to the plate E about *e* as an axis.

As the motion of the arm F is irregular and not always in the same direction for one continuous movement of the former-plate E, I cause the gear M' to be moved somewhat to compensate for this. On the shaft L, I arrange

a cam K, which acts upon a rod k to reciprocate it, and this by link k^2 rocks the gear or rack M'. The cams K and K' insure a proper return movement of the arm F and former-plate E, and in time with the rotations of the cylinder C. In place of these devices for controlling the movement of the plate E relatively to the cylinder C the said plate may be moved or operated by any other suitable means. The return movement of the plate E is unimportant, so long as it is secured in time to receive a new bag-tube or section thereof.

The cylinder C has pivoted upon its periphery fingers G G, which are normally out of the line of the bag-tube, but which may be projected inwardly by the action of a cam I', secured to the main frame A. The fingers G G are connected together by arms g and a link G', arranged in the under side of the cylinder-surface, and one of them is further provided with an arm G^2, adapted to come in contact with the cam I' during the rotation of the cylinder and thus cause said fingers to be projected inward, as indicated in dotted lines in Fig. 2, so as to enter the bellows side folds of the tube. The former-plate E has its rear edge made sharp, as at W, so that when it presses downward upon the bag-tube it forms a transverse crease about which the paper bends, as clearly shown in Figs. 4 and 6. This former-plate E is also provided with fingers H H, corresponding to the fingers G G, which are connected by arms h and link H' precisely as are connected the fingers G G, and are operated by means of a spring J in one direction to hold them out of action, and a stationary cam I, acting upon an arm or projection H^2, to move them inward or in the other direction, so that they enter the bellows side folds precisely as at the fingers G G. Stops J' limit their movement in one direction.

The rear or free end of the former-plate E is provided with eyes E^2, which are received upon projections A', as clearly shown in Fig. 3, so as to be maintained out of the line of the bag-tube in entering between the said plate and the cylinder C after it has been caught by the nipper c and moved forward. When the bag-tube is moved to the position shown in Fig. 3, the upper layer of the paper is moved over a finger E', arranged adjacent to the axis e and below the former-plate E. As the plate E is moved forward with the bag-tube the eye E^2 leaves the projection A', as shown in Fig. 4, and the edge W presses down upon the paper, forming a line or crease. It will also be observed that as this takes place the fingers G H upon each side at their free ends are brought more or less together, and at the same time the finger E' moves away from the nipper c, opening the bellows side folds, as indicated in Fig. 4. This permits the ready entrance of the fingers G H under the action of the cams I' I, and these fingers continue to maintain their position during the successive formative actions of the machine. As the cylinder C moves forward the plate E rotates upon its own axis e and also about edge W as an axis, as indicated in Figs. 6, 7, and 8, which action is so timed that the several fingers G H, nippers g, and finger E' operate to form the several actions upon the tube substantially in the manner as indicated in Figs. 2 to 8. As this folding action is completed the fingers G H quickly fly out of the folds of the tubes when their arms G^2 H^2 lift the cams I' I, and the bag in its folded condition is still held by the nipper c and carried forward with the cylinder C. It is then delivered to the rolls S, having pins s, thence to the paste-rolls Q T, of which Q applies the paste after having received it from the rolls P P and vat O. The bottom is then folded by the knife r, which folds the paper upon itself between pressure-rolls R R. It is quite evident that the delivery, paste, and subsequent folding devices may be made in any of the well-known manners, and their particular construction is immaterial to my invention. I do not, therefore, deem it necessary to describe the minute details of these devices, but illustrate them so as to show their relative position in a machine of the class described.

When the cylinder C advances sufficiently to deliver the bag to the feed-rolls S, the star-wheel reaches the pin C^2 and opens the nipper c to release the paper bag, and the said nipper remains open until it reaches the pin C^3, which closes the nipper upon another bag-tube. I have shown two such nippers and their operating mechanism, and it is evident that so far as my improvements are concerned one or more of these devices may be employed by simply reducing or enlarging the diameter of the cylinder C, maintaining its surface speed the same.

As soon as the tube has been withdrawn from the plate E the said plate is caused to return to its original position by the operation of the arm F, cams, and gears, so that it shall be in the proper position to receive the next paper tube. As before explained, the gear M' is in effect substantially a rack, but moved by cam K, and as the arm F is oscillated about f as a center by cam K' the intermediate gear M and gear N causes a proper rotation or oscillation of the plate E about e as a center. The movement of the arm F is governed by the cam K' and arm F', and is so timed that while permitting the rotation or oscillation of the plate E about its axis e it insures the edge W moving exactly at the same speed of the surface speed of the cylinder C, so as not to displace in any manner the tube.

While I have shown the nippers upon the cylinder C, they are not necessary, as the paper tube may be severed into bag-tube sections W, Fig. 10, but left connected by short connections w, Fig. 11, so that it is in effect pulled by itself about cylinder C under the action of the rolls S' The rollers S' may be

cutting-rolls, which while drawing the tube-section through sever the bag-tube sections before they go to the pasting devices. This method of operating is indicated in Fig. 9. It will be observed that as the tube is bent over the cylinder C the upper layer will rise and pass above the finger E' of the former-plate E. In this case the bag-tube will have the diamond folds made upon the tube while still connected together. It will thus be seen that it is not necessary to employ the nippers upon the cylinder C, though it may be more desirable to use them.

It is evident that the mere mechanism for securing the several movements to the different parts may be modified or changed in various ways without departing from the spirit of the invention, and I do not, therefore, confine myself to the details of construction here shown.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a paper-bag machine, the combination of a rotating cylinder provided with one or more pairs of side-folding fingers adapted to be moved toward or from each other, a forming-plate also provided with side-forming fingers adapted to be moved toward or from each other, means for operating said fingers at definite times during the formative action upon the bag-tube, operating means for the forming-plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder, the whole operating for the purpose of opening and forming the bottom of the bag-tube, and means to move the bag-tube with the cylinder.

2. In a paper-bag machine, the combination of the rotating cylinder provided with one or more pairs of side-folding fingers adapted to be moved toward or from each other, a forming-plate also provided with side-forming fingers adapted to be moved toward or from each other, means for operating said fingers at definite times during the formative action upon the bag-tube, operating means for the forming-plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder for the purpose of opening and forming the bottom of the bag-tube, a finger moving with the forming-plate for receiving the upper sheet of the tube and lifting it during the formative action, power devices for returning the forming-plate to its original position to receive a new bag-tube, and means to move the bag-tube with the cylinder.

3. In a paper-bag machine, the combination of the rotating cylinder provided with one or more pairs of side-folding fingers adapted to be moved toward or from each other, a forming-plate also provided with side-forming fingers adapted to be moved toward or from each other, means for operating said fingers at definite times during the formative action upon the bag-tube, operating means for the forming-plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder for the purpose of opening and forming the bottom of the bag-tube, a finger moving with the forming-plate for receiving the upper sheet of the tube and lifting it during the formative action, power devices for returning the forming-plate to its original position to receive a new bag-tube, means to sustain the rear of the forming-plate clear of the surface of the revolving cylinder so as to permit the proper entrance of the paper bag between the former-plate and the surface of the cylinder, and means to move the bag-tube with the cylinder.

4. In a paper-bag machine, the combination of the rotating cylinder provided with one or more pairs of side-folding fingers adapted to be moved toward or from each other, a forming-plate also provided with forming side fingers adapted to be moved toward or from each other, means for operating said fingers at definite times during the formative action upon the bag-tube, operating means for the forming-plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder for the purpose of opening and forming the bottom of the bag-tube, means to sustain the rear of the forming-plate clear of the surface of the revolving cylinder so as to permit the proper entrance of the paper bag between the former-plate and the surface of the cylinder, and means to move the bag-tube with the cylinder.

5. In a paper-bag machine, the combination of a rotating cylinder provided with one or more nippers, power devices for opening and closing the nippers at predetermined intervals of time, pivoted side-forming fingers G G carried upon the surface of the cylinder and upon each side thereof so as to receive the bag-tube between them, power devices for operating the fingers G, G at definite times during their movement forward with the cylinder, a forming-plate E also provided with side-forming fingers H H adapted to be brought into alinement above the fingers G G in the preliminary operation of forming the bag, a movable frame to which said forming-plate is hinged, power devices for moving said movable frame, power devices for oscillating the said forming-plate upon the movable frame so that its rear edge travels in conjunction with and at the same rate of speed as the cylinder, and means for operating the forming-fingers of the former-plate.

6. In a paper-bag machine, the combination of a rotating cylinder provided with one or more nippers, power devices for opening and closing the nippers at predetermined intervals of time, pivoted forming-fingers G G carried upon the surface of the cylinder and upon each side thereof so as to receive the bag-tube between them, power devices for operating

the fingers G G at definite times during their movement forward with the cylinder, a forming-plate E also provided with the forming-fingers H H adapted to be brought into alinement above the fingers G G in the preliminary operation of forming the bag and also provided with a finger rearwardly extending at its forward end for separating the upper layer of the bag-tube when opening the same during the oscillation of the plate, a movable frame to which said forming-plate is hinged, power devices for moving said movable frame, power devices for oscillating the said forming-plate upon the movable frame so that its rear edge travels in conjunction with and at the same rate of speed as the cylinder, and means for operating the forming-fingers of the forming-plate.

7. In a paper-bag machine, the combination of the rotating cylinder for the bag-tube provided with one or more pairs of folding-fingers adapted to be moved toward or from each other, a forming-plate also provided with forming-fingers adapted to be moved toward or from each other, means for operating said fingers at definite times during the formative action upon the bag-tube, operating means for the forming-plate adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder for the purpose of opening and forming the bottom of the bag-tube, and connecting mechanism for timing the movements of the rotating cylinder and the forming-plate.

8. In a paper-bag machine, the combination of a rotating cylinder provided with one or more nippers, power devices for opening and closing the nippers at predetermined intervals of time, pivoted forming-fingers G G carried upon the surface of the cylinder and upon each side thereof so as to receive the bag-tube between them, power devices for operating the fingers G, G at definite times during their movement forward with the cylinder, a forming-plate E also provided with forming-fingers H H adapted to be brought into alinement above the fingers G G in the preliminary operation of forming the bag, a movable frame to which said forming-plate is hinged, power devices for moving said movable frame, power devices for oscillating the said forming-plate upon the movable frame so that its rear edge travels in conjunction with and at the same rate of speed as the cylinder, means for operating the forming-fingers of the forming-plate, and connecting devices for timing the movements of the movable frame the former-plate and the rotating cylinder.

In testimony of which invention I have hereunto set my hand.

WM. LIDDELL.

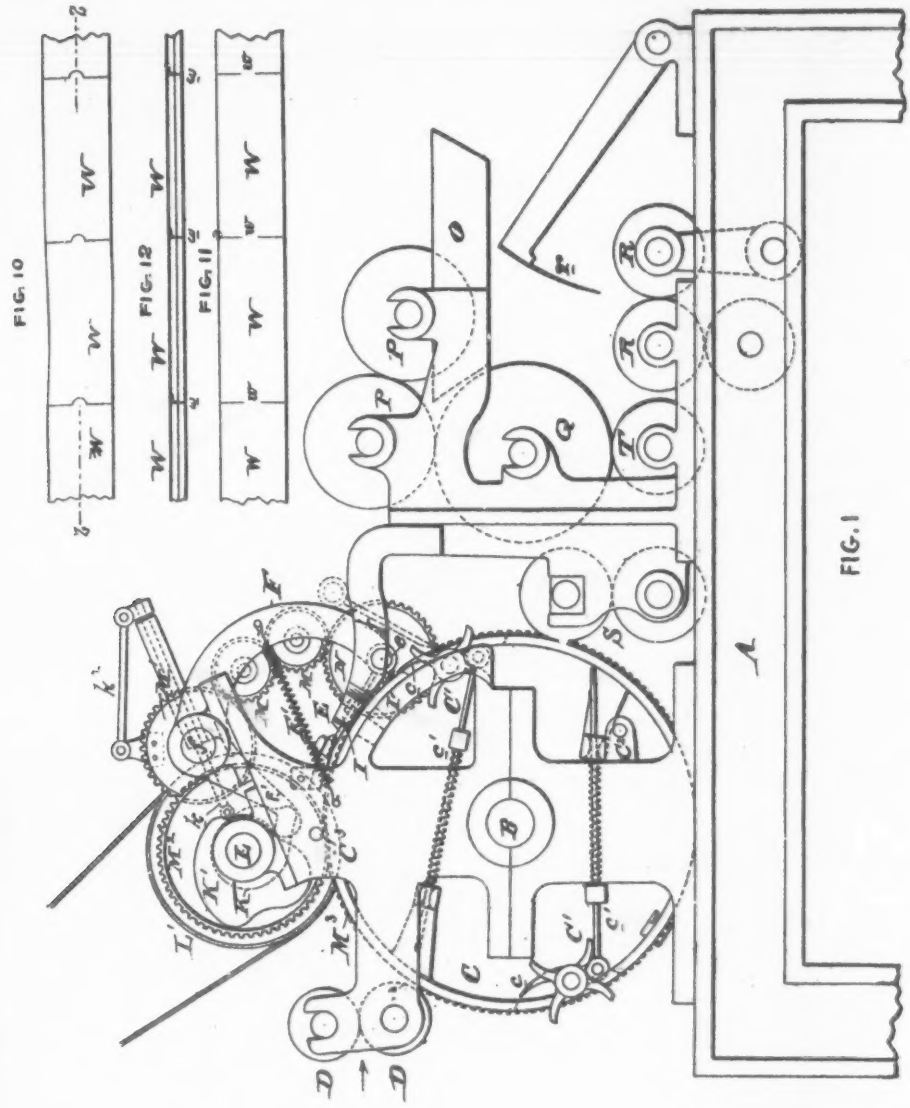
Witnesses:
R. M. HUNTER,
ERNEST HOWARD HUNTER.

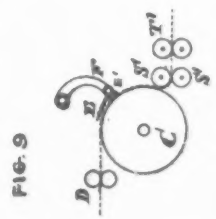
(No Model.) 3 Sheets—Sheet 1.

W. LIDDELL.

PAPER BAG MACHINE.

No. 558,969. Patented Apr. 28, 1896.





Witnesses.

Henry Dumy

Wm. L. Evans

Inventor:

William Liddell

By Wm. L. Evans

Attorney.

(No Model.) 3 Sheets—Sheet 2.

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PAPER BAG MACHINE.

No. 558,969. Patented Apr. 28, 1896.

FIG. 2.

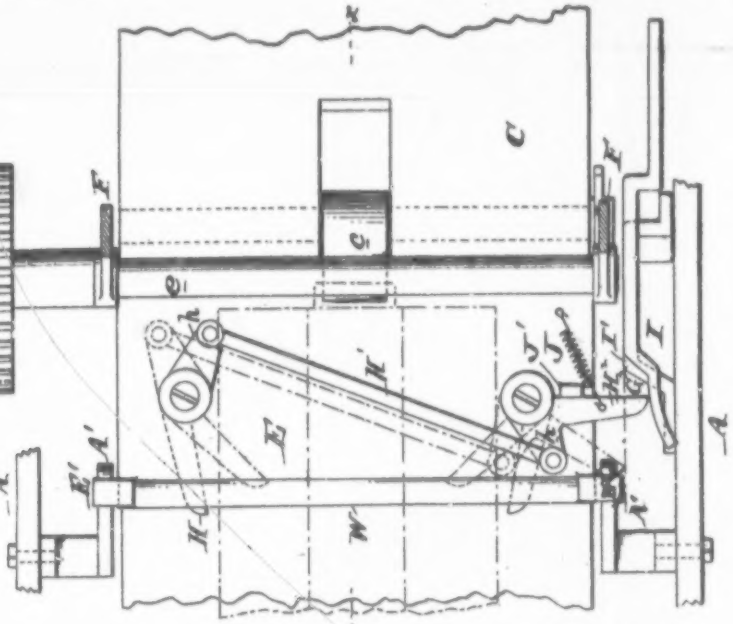


FIG. 3.

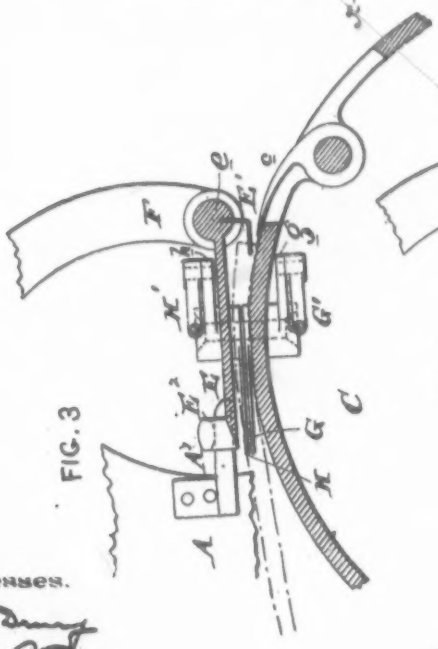
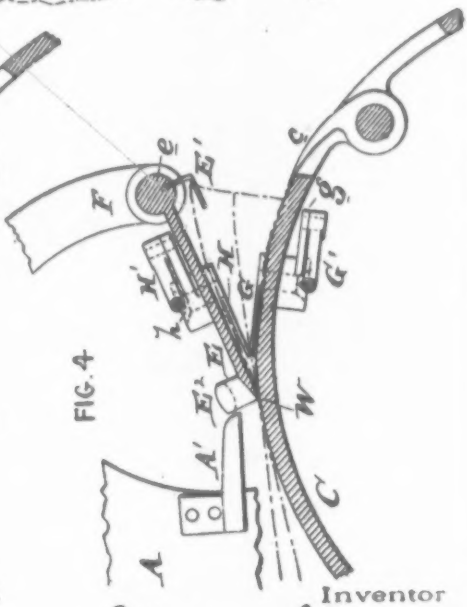


FIG. 4.



Witnesses.

Henry Dennett

Wm. L. Beans

Inventor

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By A. R. Ellis & Co.

Attorney

(No Model.) 3 Sheets—Sheet 3.

W. LIDDELL.

PAPER BAG MACHINE.

No. 558,969. Patented Apr. 28, 1896.

FIG. 5

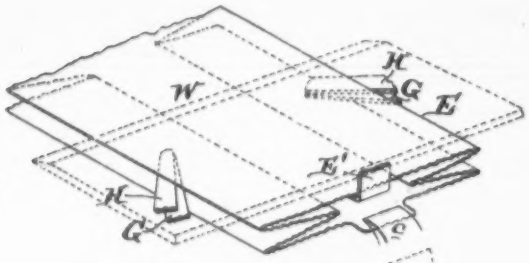


FIG. 6

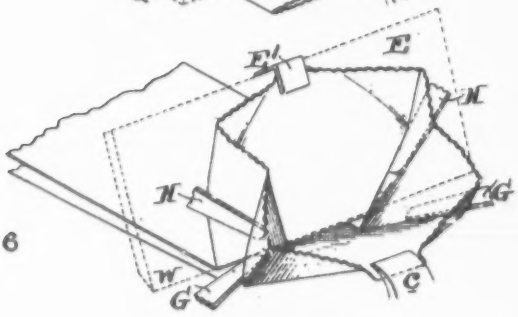


FIG. 7.

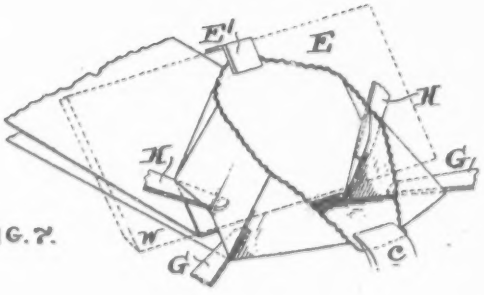
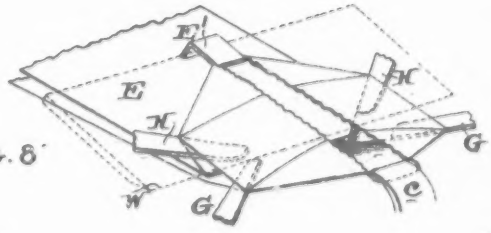


FIG. 8



Witnesses.

Henry Dewey

Wm. L. Evans

Inventor.

William Liddell,

By Wm. Liddell & Co

Attorney.

744 905

(No Model.) 7 Sheets—Sheet 1.

E. E. CLAUSSEN.

PAPER BAG MACHINE.

No. 574,020. Patented Dec. 29, 1896.

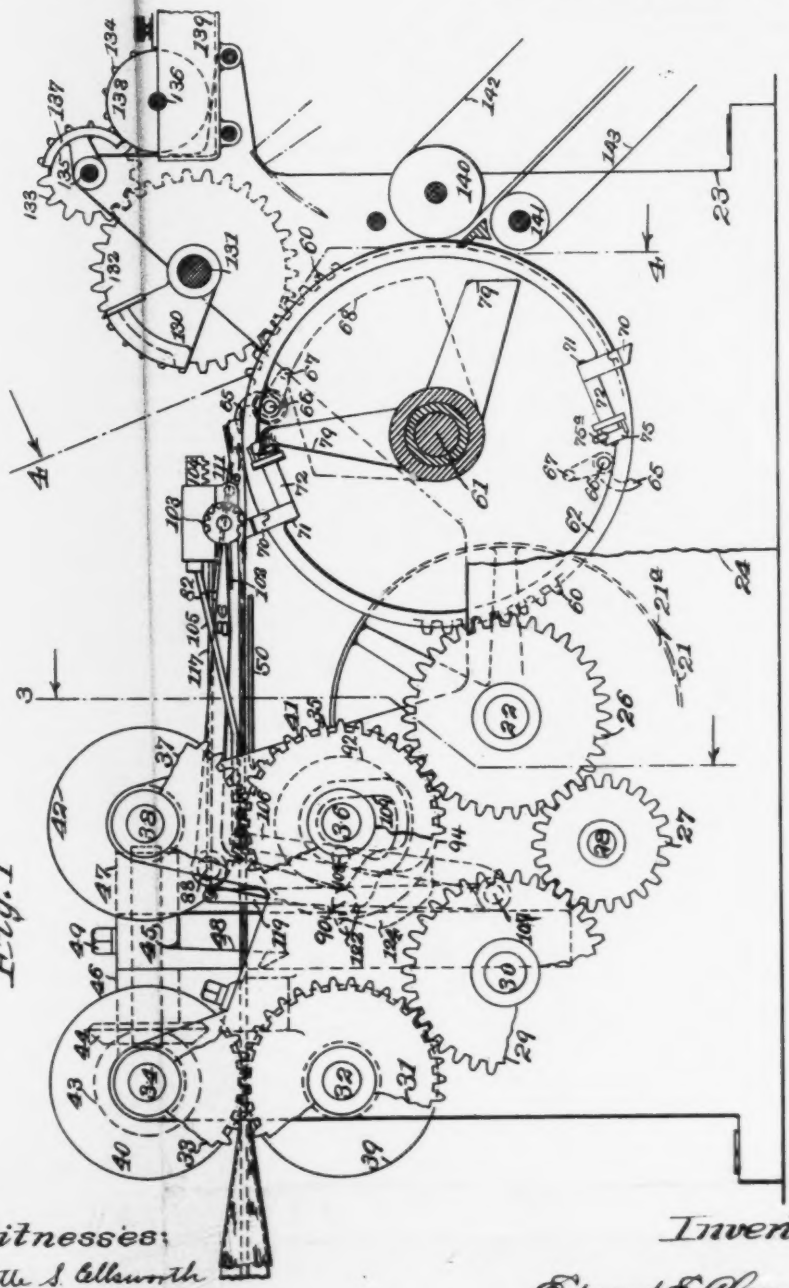


Fig. 1

Witnesses:
Juliette S. Ellsworth
Carl J. Dietrich

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Edward E. Claussen

746 906

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PAPER BAG MACHINE.

No. 574,020. Patented Dec. 29, 1896.

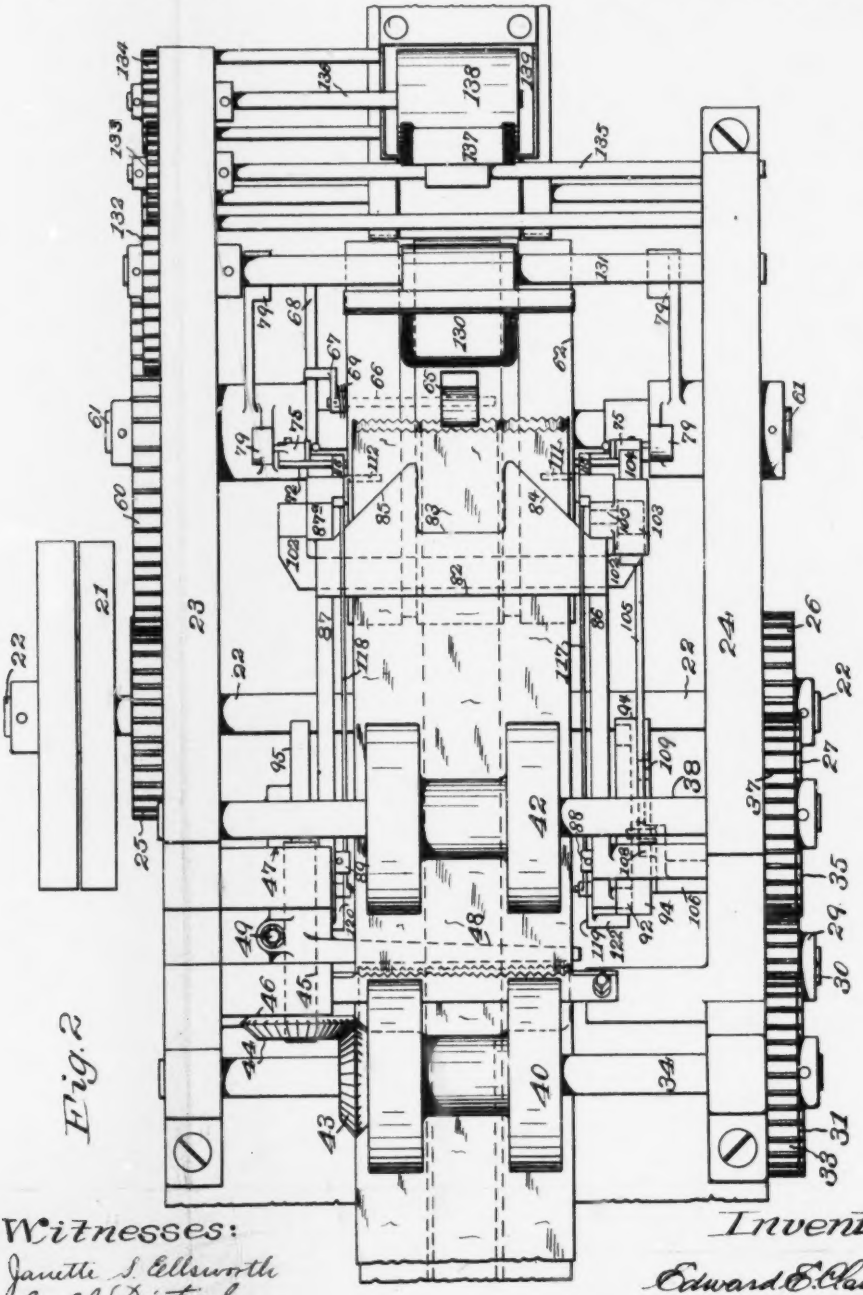

Fig. 2

Witnesses:
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Carl J. Dietrich

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Edward E. Claussen

748 907

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PAPER BAG MACHINE.

No. 574,020. Patented Dec. 29, 1896.

Fig. 3.

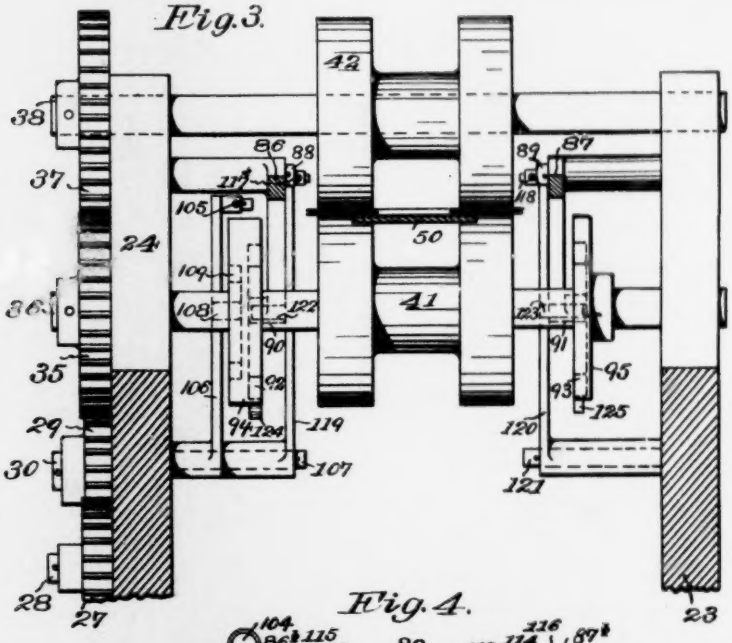
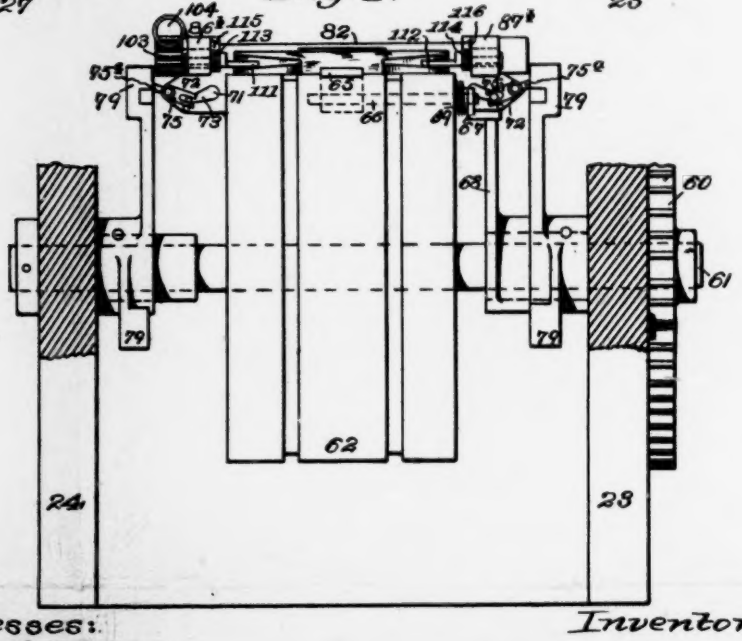


Fig. 4.



Witnesses:
Janette L. Ellsworth
Carl J. Diethick

Inventor:
Edward E. Claussen

756 908

(No Model.) 7 Sheets—Sheet 4.

E. E. CLAUSSEN.

PAPER BAG MACHINE.

No. 574,020. Patented Dec. 29, 1896.

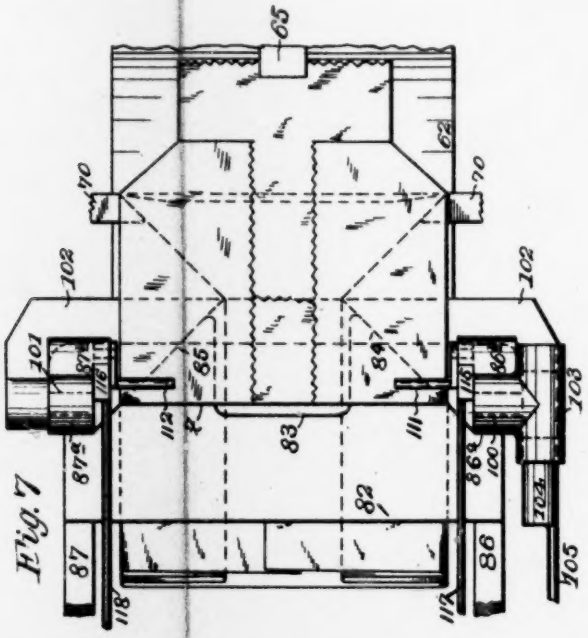


Fig. 7

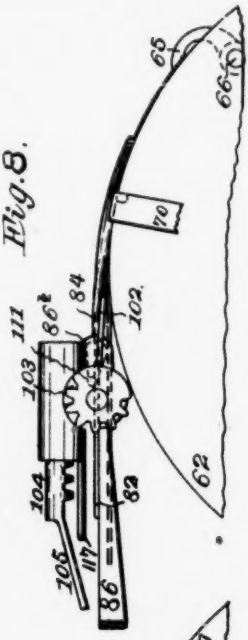


Fig. 8.

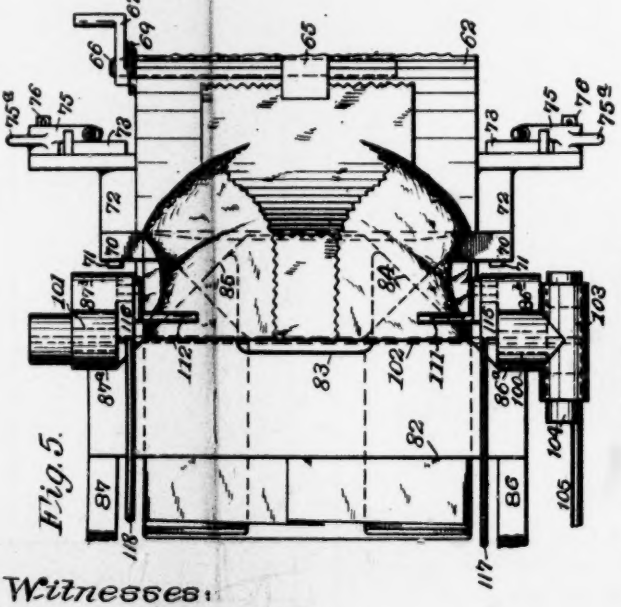


Fig. 5.

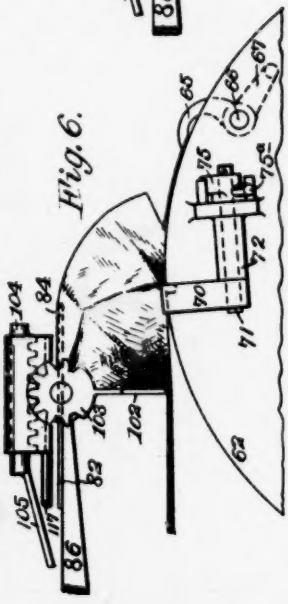


Fig. 6.

Witnesses:
Janette S. Ellsworth
Carl J. Dietrich

Inventor:
Edward E. Claussen

752 909

(No Model.) 7 Sheets—Sheet 5.

E. E. CLAUSSEN.

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No. 574,020. Patented Dec. 29, 1896.

Fig. 9

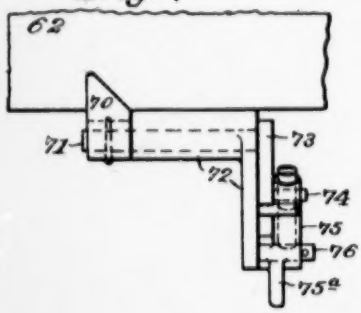


Fig. 10

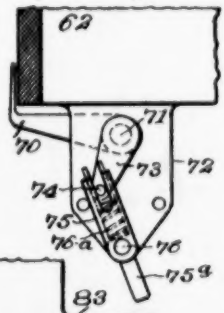


Fig. 11.

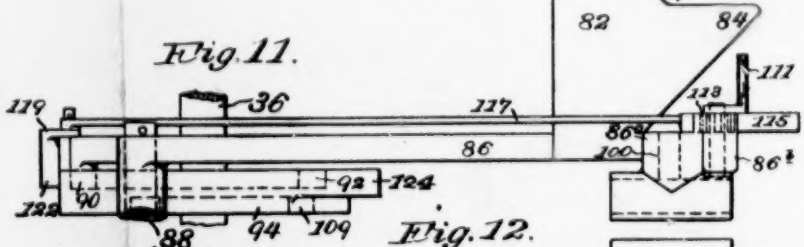
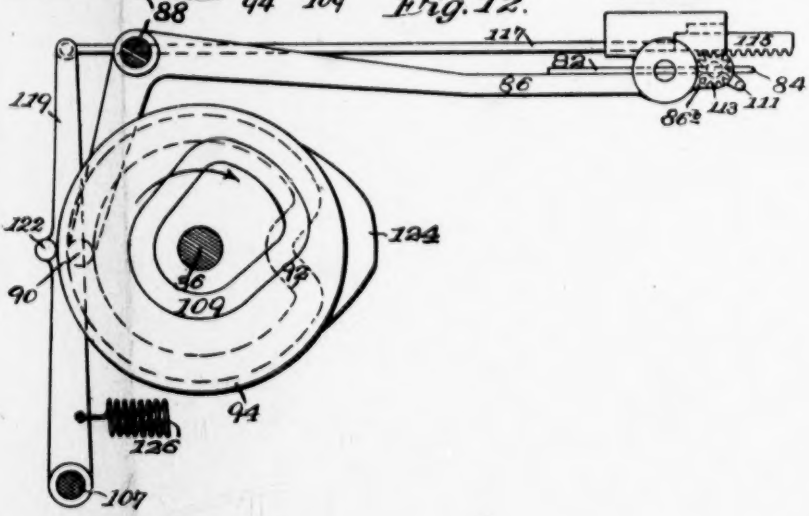


Fig. 12.



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E. E. CLAUSSEN.

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Fig. 13.

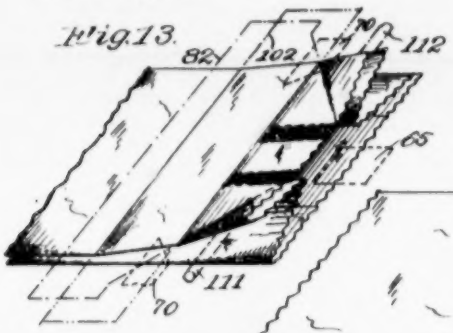


Fig. 14.

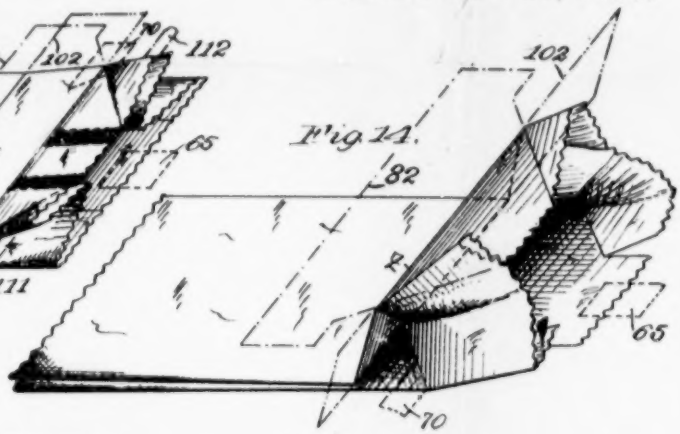


Fig. 15.

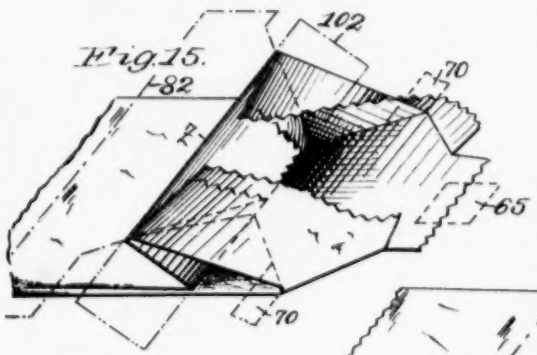


Fig. 16.

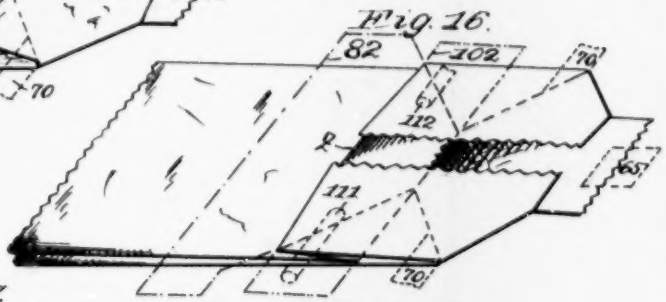
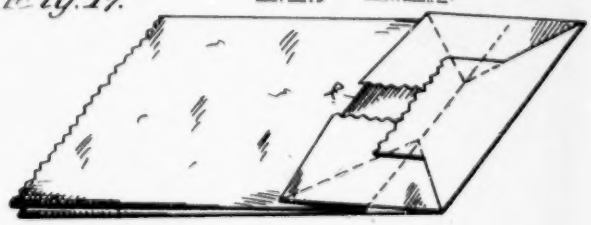


Fig. 17.



Witnesses:
Janette S Ellsworth
Carl J. Dietrich

Inventor:
Edward E. Claussen

(No Model.) 7 Sheets—Sheet 7.

E. E. CLAUSSEN.

PAPER BAG MACHINE.

No. 574,020. Patented Dec. 29, 1896.

Fig. 19.

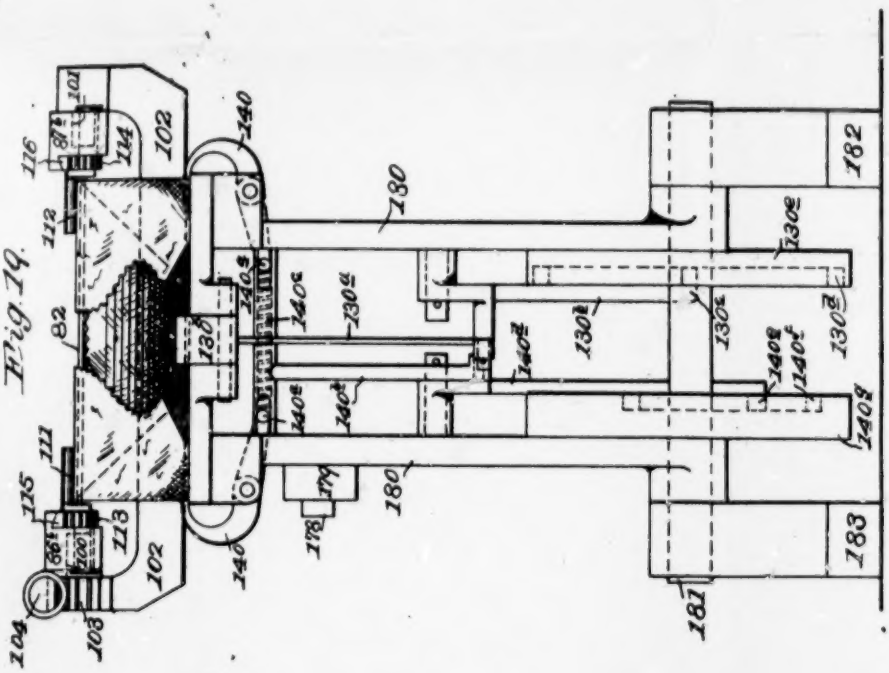
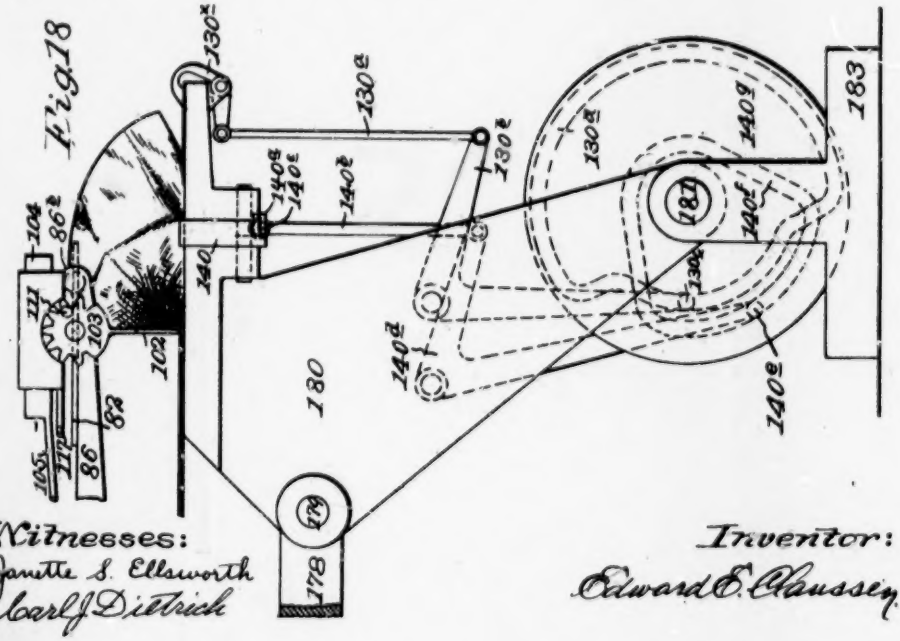


Fig. 18.



Witnesses:
Janette S. Ellsworth
Carl J. Dietrich

Inventor:
Edward E. Claussen

UNITED STATES PATENT OFFICE.

EDWARD E. CLAUSSEN, OF HARTFORD, CONNECTICUT.

PAPER-BAG MACHINE.

SPECIFICATION forming part of Letters Patent No. 574,020, dated December 29, 1896.

Application filed July 18, 1896. Serial No. 599,609. (No model.)

To all whom it may concern:

Be it known that I, EDWARD E. CLAUSSEN, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Paper-Bag Machines, of which the following is a full, clear, and exact specification.

This invention relates to an improved machine for automatically manufacturing square-bottomed paper bags from tucked-paper tubing. The mechanisms herein shown and described represent this invention in its adaptation to that class of machines in which the traveling folding-bed that carries the tube or blank onward is represented as a rotating carriage or cylinder, and also shown in its adaptation to machines having a reciprocating or oscillating folding-bed.

The object of this invention is to provide simple and rapid means for forming the truncated diamond on tucked-paper tubing and then pasting and cross-folding the front flap and completing the bag. In my present invention I accomplish these objects as follows: The tucked-paper tube as it is drawn from the former is guided into the bite of a pair of drawing-rolls, severed into bag-blank lengths, and guided into the bottom-forming mechanisms for forming the diamond folds in bellows-sided tubing, consisting of an oscillating V-plate to which is vibratorily mounted the swinging tucker-plate, and a traveling folding-bed provided with a front clip which clamps the lower ply to the folding-bed, and a pair of bevel-edged side clips which enter into the tucks of the tube and press the lower plies of the tucks to the folding-bed. The blank is held in these bottom-forming mechanisms as follows: Above and superimposed on the blank is placed the tucker-plate, which has a vibratory motion and is hinged to the V-plate and having its rear edge extending back up to where the characteristic primary transverse fold-line is to be made in the blank. Superimposed on the tucker-plate is the V-plate, provided with the bevel edge, against which the projecting corners of the upper ply and the upper plies of the tucks are turned and held. The V-plate is then caused to swing away from the traveling folding-bed, and at the same time the swinging tucker-plate is vibrated forward, the two coacting to fold and form the primary transverse folding-line, and simultaneously the traveling folding-bed, with its clips, carrying the blank forward to allow for the distending of the triangular folds and the formation of the truncated diamond. The tube is then drawn from the V-plate, the paste applied, and the front flap folded and pressed and the bag completed.

The invention will best be understood as described in connection with the drawings, in which it is illustrated, and in which—

Figure 1 is a side view of my improved machine, partly in section, showing the drawing-rolls that draw the tubing from the tube-forming mechanisms, it being understood that the same is produced by any of the well-known methods. The blank in the machine is represented in a position to be severed from the continuous tube and being clamped by the front clip to the rotating cylinder and ready to have the subsequent folding operations performed thereon, also showing at the left end of the machine a part of the broken-away former. Fig. 2 is a plan view of that which is represented in Fig. 1. Fig. 3 is a cross-sectional view taken on line 3 3 of Fig. 1 in the direction of the arrows. Fig. 4 is a sectional end view taken on the broken line 4 4 of Fig. 1 in the direction of the arrows. Figs. 5 and 6 are respectively a plan and a side view, in an enlarged scale, of the folding mechanisms in a position where the truncated diamond is about one-half completed. Figs. 7 and 8 are respectively a plan and a side view of that which is shown in Figs. 5 and 6, in a still farther advanced position and having the truncated diamond completed, ready to be drawn from the V-plate, and paste applied thereto. Figs. 9 and 10 are respectively a plan and an end view of the side clips that hold the lower plies of the tucks to the traveling folding-bed or cylinder. Figs. 11 and 12 are a plan and a side view of the V-plate and turning-fingers with their mechanisms for operating the same drawn in an enlarged scale. Fig. 13 is a perspective view of a blank, showing the front triangular corner-flaps partly turned over and that portion of the tube that is to be folded forward partly raised and beginning to indicate where the characteristic primary

transverse folding-line is to be located, showing also the tucker-plate, the V-plate, and the clips in their respective operative position. Fig. 14 is a perspective view of the blank, showing the front triangular corner-flaps still more folded over and also showing the part of the tube that is to be tucked under in an advanced position, also indicating the respective positions of the bottom-forming mechanisms. Fig. 15 is a perspective view of the blank in a still more advanced stage, showing the truncated diamond nearly completed. Fig. 16 shows a perspective view of the blank when the truncated diamond is completed, with the bottom-forming mechanisms in their relative positions. Fig. 17 is a perspective view of the completed bag ready for commercial use or to be packed and shipped. Fig. 18 is a side view of a modification of the machine in its adaptation to a reciprocating carriage, showing the blank partly folded into the truncated diamond. Fig. 19 is an end view of that which is shown in Fig. 18.

A description will first be given of the construction and operation of each section of the machine, and afterward their combined mode of operation will be described.

Power is communicated to the machine by the pulley 21 in the direction of the arrow 21^a and is fastened to the shaft 22, which is journaled in the frames 23 and 24 and carries on each end the gear 25 and 26. The gear 26 meshes into the intermediate gear 27, journaled on the stud 28, which is fastened on the outside to the frame 24. Said gear 27 meshes into the gear 29, rotatably mounted on the stud 30, and gear 29 meshes into the gear 31 on the shaft 32, meshing into the gear 33 on shaft 34. The gear 26 also meshes into the gear 35, fastened on the shaft 36, which again meshes into the gear 37 on shaft 38. The shafts 32, 34, 36, and 38 are all journaled in the frames 23 and 24 and have securely fastened thereto the drawing-rolls 39, 40, 41, and 42, respectively, as illustrated in the drawings in Figs. 1, 2, and 3, which draw the tubing into the machine. The shaft 34 carries rigidly connected thereto on the left-hand side next to the drawing-roll 40 the miter 43, which meshes into the miter 44, fastened on the shaft 45, journaled in the projecting hubs 46 and 47 of the frame 23. The striker-arm 48 is clamped to the shaft 45 by the clamp-screw 49 and revolves in union therewith.

The gears 39, 40, 41, and 42 are so geared in relation to the striker-arm 48 that to each revolution of the striker-arm a length of tubing is drawn forward of sufficient length to make the body and the bottom-forming end on the bag-blank. 50 is a supporting-plate that supports the bag-blank as it travels from the drawing-rolls 41 and 42 to the cylinder 62.

The gear 25 meshes into the gear 60, which is fastened to the shaft 61, which is journaled in the frames 23 and 24 and which carries the cylinder 62. The cylinder is provided with two sets of front and side clips adapted to hold the paper-tube to the cylinder, as will be more fully explained hereinafter. The front clips 65 are fastened to shafts 66 and are journaled in the cylinder 62, the outer ends of which are provided with cam-arms 67, and as the cylinder revolves, and carrying the cam-arms along therewith, they engage the stationary cam 68, which is fastened to the hub of the bracket 23. Springs 69 keep the clips in the normally open position. The timing of the cam 68 in relation to the rotation of the cylinder and the severing of the blank by the rotation of the striker-arm is such that the front clip 65 is caused to close against the pressure of the spring 69 as the leading end of the tube advances and holds the lower ply of the tube thereto, as shown in Fig. 1, and to carry the same onward and to release the same again when the truncated diamond is completed. Coacting with each front clip is a pair of bevel-edged side clips 70, which are fastened to shafts 71, pivotally mounted in bosses 72, adjacent and integral to the sides of the cylinder 62. The projecting free ends of the shafts 71 are provided with arms 73, having the stud 74 projecting therefrom and engaging a slot in the spring-casing 75, which is pivotally mounted on the hubs 72 on the pivot 76 and bearing the extensions 75^a. Springs 76^a, held in the casings 75, press upon the studs 74 and keep the clips in the closed or open position, as the case may be, as best shown in Figs. 9 and 10. The extensions 75^a are operated by the stationary cams 79, mounted on hubs of the stationary frames 23 and 24. The cam 68, which operates the front clips, and the cams 79, which operate the bevel-edged side clips as the cylinder revolves, are so shaped in relation to the rotation of the cylinder that the same are opened when advancing into the position of Fig. 1, and then close, when in position of Fig. 1, to clasp the lower ply of the tube and the plies of the lower tucks onto the cylinder and carry the blank along until the truncated diamond is formed, as shown in Figs. 5, 6, 7, and 8.

The V-plate 82 consists of a flat plate having the central opening 83 and the two forty-five-degree edges 84 and 85 and fastened to the arms 86 and 87, pivoted to studs 88 and 89, and carrying at their lower ends the projections 90 and 91, which engage the cam-grooves 92 and 93 of the cams 94 and 95, respectively, and fastened to the shaft 36, giving a vibratory motion to the V-plate. The timing of the cam-grooves 92 and 93 in relation to the rotation of the cylinder and the clips carried thereby is such that the V-plate is caused to be carried away from the cylinder directly after the clips enter or while they are entering the tucks of the tube, and then bring the same back to its normal position, as shown in Figs. 1 to 8, inclusive.

The arms 86 and 87 are provided with hubs 86^a and 87^a, in which are pivoted in trunnions 100 and 101 the tucker-plate 102, the right

side of which has fastened the gear 103, engaging the rack 104, to which is attached the connecting-rod 105, the rear end of which is pivotally connected to the arm 106, swinging on the stud 107. The arm 106 carries the projection 108, engaging the cam-groove 109 in the cam 94, and thus the tucker-plate 102 is rotated through an arc of a circle of about one hundred and eighty degrees. The center line of the trunnions 100 and 101 passes through the two intersecting points formed by the forty-five-degree edges of the V-plate and the edges of the tube, and also corresponds with the rear edge Z, as shown in Figs. 7, 14, 15, 16, and 17.

The timing of the cam-groove 109 in relation to the V-plate is such that the tucker-plate is caused to swing forward through an arc of a circle of about ninety degrees and adapted to travel with and define the primary transverse fold as the V-plate rises away from the cylinder and continues and finishes its stroke as the V-plate descends toward the cylinder, as is clearly shown in the drawings in Figs. 1, 2, 5, 6, 7, and 8.

The arms 86 and 87 are also provided with the lugs 86^b and 87^b, into which are fastened the pivots upon which the fingers 111 and 112 are pivotally mounted, the hubs of which are provided with teeth forming a part of a gear, as at 113 and 114, respectively, into which mesh the racks 115 and 116, connected to the rods 117 and 118. The other ends of the rods 117 and 118 are pivotally attached to the cam-arms 119 and 120, pivoted on the studs 107 and 121 and provided with the projections 122 and 123, engaging the cam projections 124 and 125 of the cams 94 and 95, respectively, the springs 126 always keeping the projections 122 and 123 up against their respective cams. The cam projections 124 and 125, which cause to operate the fingers 111 and 112, are of such shape in relation to the rotation of the cylinder and the entering of the bottom-forming end of the bag-blank between the V-plate and the cylinder that the fingers are in the lower position, so that the fingers may enter the tucks of the tube while the same is entering between the V-plate and the cylinder and be vibrated immediately back over to the V-plate, carrying the front triangular corners against and over the forty-five-degree edges of the V-plate and clamp the same thereto, as shown in Figs. 1, 2, 5, 6, 7, and 8.

Paste is applied to the truncated diamond by means of the paste-sector 130, mounted on the shaft 131, to which is fastened the gear 132, meshing into the cylinder-gear 60. The gear 132 also drives the train of gears 133 134, fastened to shafts 135 136, which have fastened thereto the paste-quadrant 137 and paster-roll 138, respectively, which turns in the paste-box 139. The gears 132 and 133 are geared with relation to the cylinder-gear 60 in such a manner that the face of sector 130 is presented to the cylinder twice to every one revolution of the cylinder, and in this manner the paste is deposited at regular intervals to the bag as it passes along. The front flap is folded in the well-known manner and the bag delivered between the delivery-rolls 140 and 141 and taken from the machine by the bands 142 and 143 in the well-known manner.

In Figs. 18 and 19 I have represented this invention in its adaptation where the traveling folding-bed is represented as an oscillating or reciprocating carriage in place of the rotating cylinder, as has been used in this class of machines, and is applicable to such a paper-bag machine as that shown in Letters Patent of the United States No. 444,727, of January 13, 1891, granted to me.

The connecting-rod 178 is worked by a crank (not shown in the drawings) and is pivoted by the stud 179 to the rocking carriage 180, and that carriage rocks upon the shaft 181 in brackets 182 and 183. The operations of the V-plate 82, the swinging tucker-plate 102, and the fingers 111 and 112 are identical with the foregoing description, and therefore need no further explanation. The operation of the front clips and side clips, which clamp the lower ply of the tube and the lower plies of the tucks upon the oscillating carriage, is as follows: At the front end of the carriage is pivotally mounted the front clip 130^x, pivotally connected to the connecting-rod 130^a, the lower end of which is connected to the cam-arm 130^b, provided with the projection 130^c, engaging the groove 130^d of cam 130^e, which is fastened to the shaft 181. The timing of the cam-groove in relation to the oscillation of the carriage is such that the clip is caused to close upon the bag-blank as the same is presented to the carriage and opened when the truncated diamond is completed.

The bevel-edged side clips 140 are pivotally mounted in lugs on each side of the carriage and have projections 140^a, engaging slots of the sleeve 140^b, which is provided at its upper end with a hollow transverse cross-bar adapted to receive a spring 140^c, pressing upon the side-clip projections 140^a and keeping them in the closed position and pressed on the carriage as a means for allowing for wear in the parts of the mechanisms and slight irregularities which may occur in the cam. The lower end of the sleeve 140^b is connected to the cam-arm 140^d, provided with the projection 140^e, engaging the cam-groove 140^f of cam 140^g. The timing of the cam-groove in relation to the oscillation of the carriage is such that the side clips are caused to swing into the tucks of the tube and clamp the lower plies of the tucks upon the carriage when the tube enters the same and to open and release when the truncated diamond is completed.

The operation of the machine is as follows: The paper is taken from a roll and folded by any well-known mechanisms (not shown in this application) into a tucked tube and drawn between the rolls 39 and 40 under the serrated knife into the machine and the

blanks severed from the continuous tube by the striker 48 revolving across the path of the tube and forcing it against the serrated knife and severing the blank therefrom at each revolution. The drawing-rolls are so geared with relation to the revolution of the striker as to feed through a suitable length for each revolution thereof. The leading end of the bag-blank is guided between the cylinder and the revolving tucker-plate pivotally mounted to the V-plate. The lower supporting surface or cylinder is provided with the front clip and the bevel-edged side clips.

The tube is supported from beneath in its travel from the drawing-rolls to the cylinder by the supporting-plate 50, and as the bottom-forming end of the tube approaches the cylinder the fingers 111 and 112 are in their lowest position, so that as the tube advances the fingers enter the tucks and the front clip 65, being held open by the spring 69, is guided into the bite of said clip. The front clip is then closed, being carried forward by the cylinder and by virtue of the cam 68. The side clips 70 are then closed by means of the cams 79, thus holding the lower part of the tube firmly upon the cylinder simultaneously. The fingers 111 and 112 are caused to vibrate and turn over on top of the V-plate by means of the cams 124 and 125 and carrying with them the front projecting triangular corners against the forty-five-degree edges of the V-plate and press and hold same in that position. As the cylinder continues to rotate the V-plate is elevated by means of the cam-grooves 92 and 93, and simultaneously the swinging tucker-plate 102 is caused to be swung forward by the cam-groove 109, the folding edge forming the characteristic primary transverse folding-line across the tubular blank and unfolding and forming the well-known inside triangular folds passing from the positions as shown in Figs. 13, 14, 15, and 16, inclusive. Then the truncated diamond, as shown in Fig. 16, is drawn off from the V-plate, the fingers 111 and 112 having been elevated a little to release the same. The blank then is presented to the paste-sector to have the paste applied, and then the front flap is turned over and pressed to the bag bottom and delivered to the bands 142 and 143 to be dried and then packed.

I claim as my invention—

1. In a paper-bag machine the combination of a traveling folding-bed, of the V-plate provided with bevel edges, the oppositely-disposed turning-fingers adapted to enter the tucks of a paper-bag blank and fold the projecting corners of that bag-blank against the bevel edges, and devices coöperating with the V-plate to effect the unfolding of the blank substantially as described.

2. In a paper-bag machine the combination of a traveling folding-bed, the V-plate provided with the beveled edges, the oppositely-disposed turning-fingers adapted to enter the tucks of a paper-bag blank and fold the projecting corners of the bag-blank against the bevel edges and press and hold them upon that V-plate, and devices coöperating with the V-plate to effect the unfolding of the blank substantially as described.

3. In a paper-bag machine the combination of a traveling folding-bed, of a V-plate provided with the forty-five-degree edges and adapted to receive an oscillatory motion to carry the same away and toward the folding-bed, the oppositely-disposed turning-fingers adapted to enter the tucks of a paper-bag blank and fold and press the projecting corners of that blank upon that V-plate and devices to coöperate with the V-plate to effect the unfolding of the blank substantially as described.

4. In combination with means for supporting a blank of tucked-paper tubing, means for forming the characteristic right-angled triangular folds in the side tucks thereof, consisting of a V-plate adapted to be vibrated, the turning-fingers with means for turning the same to fold the projecting triangular corners against the forty-five-degree edges of the plate, the tucker-plate with means to vibrate the same on an axis passing through the apexes formed by the edges of the V-plate and the edges of the tubing, combined and operating substantially as described.

5. In combination with means for supporting a blank of tucked-paper tubing, means for forming the characteristic right-angled triangular folds in the side tucks thereof, consisting of a V-plate adapted to be vibrated, the turning-fingers with means for turning the same, and to fold the projecting corners against the forty-five-degree edges of the V-plate the tucker-plate arranged to travel with the V-plate and having its folding edge adapted to travel with and define the primary transverse fold, all parts combined and operating for the purpose set forth.

6. A paper-bag machine comprising the supporting-bed for the tucked-paper tube with means for clamping the same thereto, the V-plate mounted above the paper-bag blank and adapted to be vibrated, means for clamping the projecting triangular corners of the blank to the V-plate, the tucker-plate mounted to the V-plate, means to vibrate the same, all combined and operating for unfolding and opening the tucked paper tube into the truncated diamond while the bag-blank is carried forward substantially as described.

7. In a paper-bag machine the combination of the revolving cylinder provided with one or more front clips, and the oppositely-disposed bevel-edged side clips, the V-plate provided with the beveled edges and adapted to receive an oscillatory motion, means for turning the projecting corners of the bag-blank against the beveled edges of the V-plate and hold them in substantially that position, the tucker-plate adapted to define the transverse folding-line across the blank, all combined

and operating for unfolding and opening the tucked-paper tube into the truncated-diamond form while the bag-blank is carried forward.

8. In a paper-bag machine the combination of a revolving cylinder provided with one or more front clips and the oppositely-disposed side clips and means for operating the same at predetermined intervals, the V-plate provided with the forty-five-degree edges and means for imparting a vibratory motion to said V-plate, turning-fingers pivotally mounted on the V-plate with means for imparting an oscillatory motion, the revolving tucker-plate pivotally mounted on the V-plate with means for imparting an oscillatory motion thereto, all parts combined and operating to unfold and open the tucked-paper tube into the truncated-diamond form while the bag-blank is being carried forward.

9. In combination with means for supporting a blank of tucked-paper tubing, the V-plate 82 provided with the edges 84 and 85 forming substantially ninety degrees with one another and mounted on arms to which is imparted a vibratory motion by means of a cam, a set of oppositely-disposed turning-fingers operatively connected and oscillating with said V-plate and adapted to swing from a position below, to a position above and on top the V-plate, the tucker-plate, the center of rotation of which is in line with the top of the V-plate and the distance from that center to its folding edge substantially equal to the depth of the tucks of the paper tube substantially as described.

10. In combination with means for supporting a blank of tucked-paper tubing, the V-plate provided with the forty-five-degree edges 84 and 85, forming substantially ninety degrees with one another and mounted on arms, to which is imparted an oscillatory motion by means of a cam, a set of oppositely-disposed turning-fingers operatively connected and oscillating with said V-plate and adapted to swing from a position below, to a position above and on top of the V-plate, the tucker-plate provided with trunnions pivoted on both sides of the V-plate in substantially such a position, that the center of rotation is in line with the top of the V-plate, the distance from that center to its folding edge is substantially equal to the depth of the tucks of the paper tube, and means for having said folding edge travel with the bag-blank for the purpose of defining the primary transverse folding-line.

EDWARD E. CLAUSSEN.

Witnesses:
J. P. WAKEFIELD,
H. C. MARQUARDT.

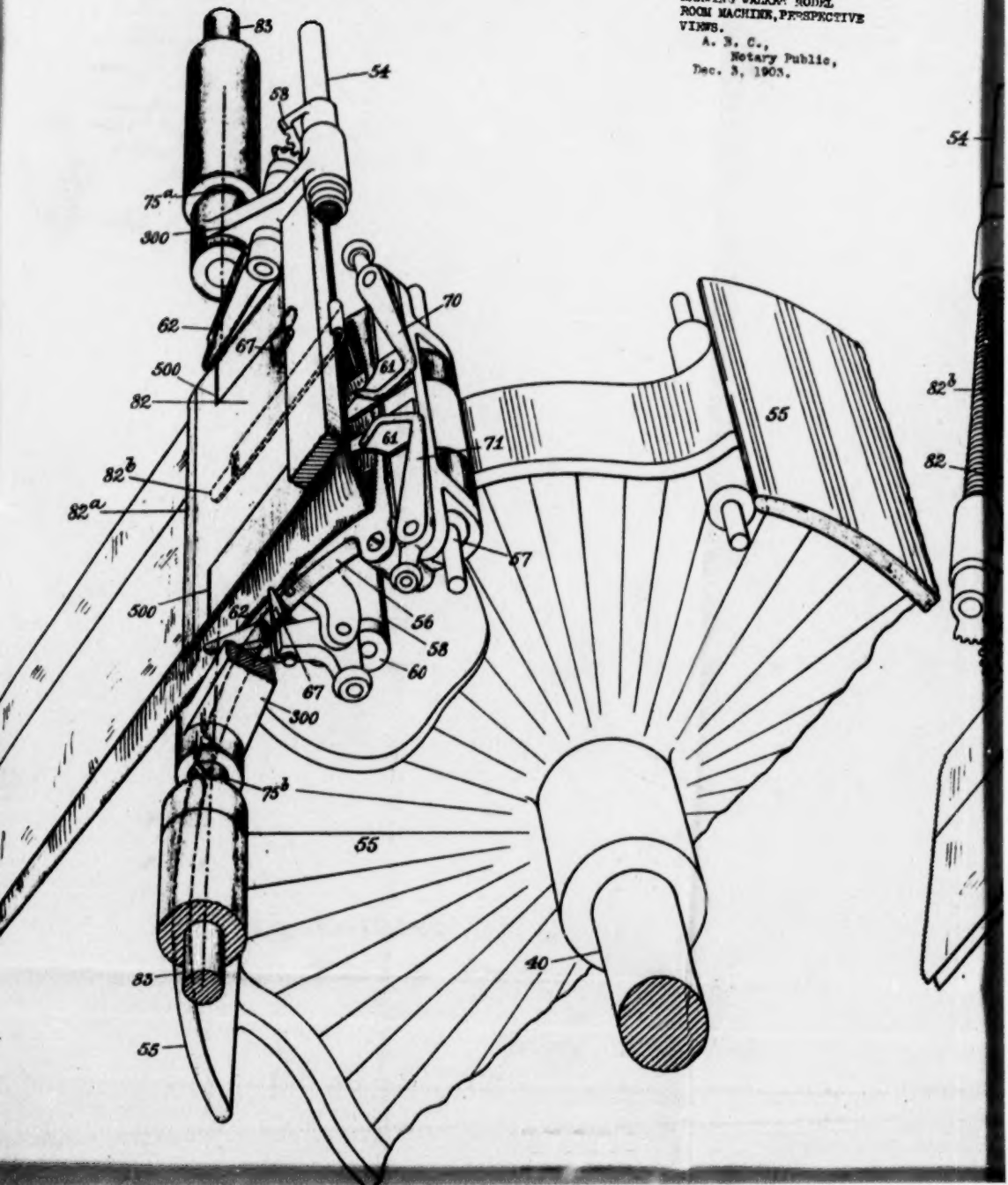
U. S. CIRCUIT COURT,
District of Maine.

EASTERN PAPER BAG CO.
v.
CONTINENTAL PAPER BAG CO

EASTERN PAPER BAG CO.
v.
WOODWARD & ROGERS CO.

COMPLAINANT'S EXHIBIT
DRAWING WALKER MODEL
ROOM MACHINE, PERSPECTIVE
VIEWS.
A. B. C.,
Notary Public,
Dec. 3, 1903.

Fig. 1



Walker Model Room Machine.

Perspective Views.

Fig. 2

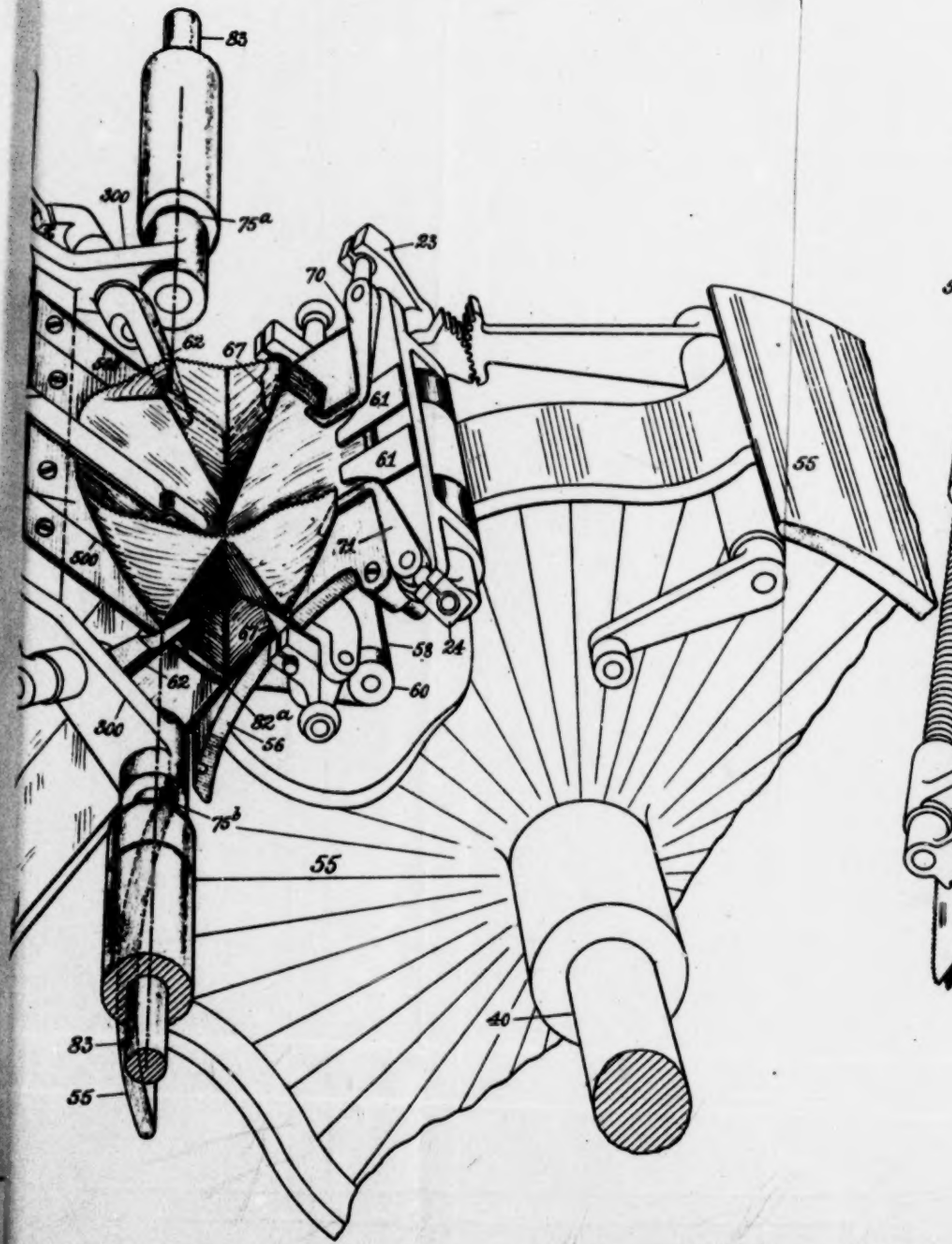
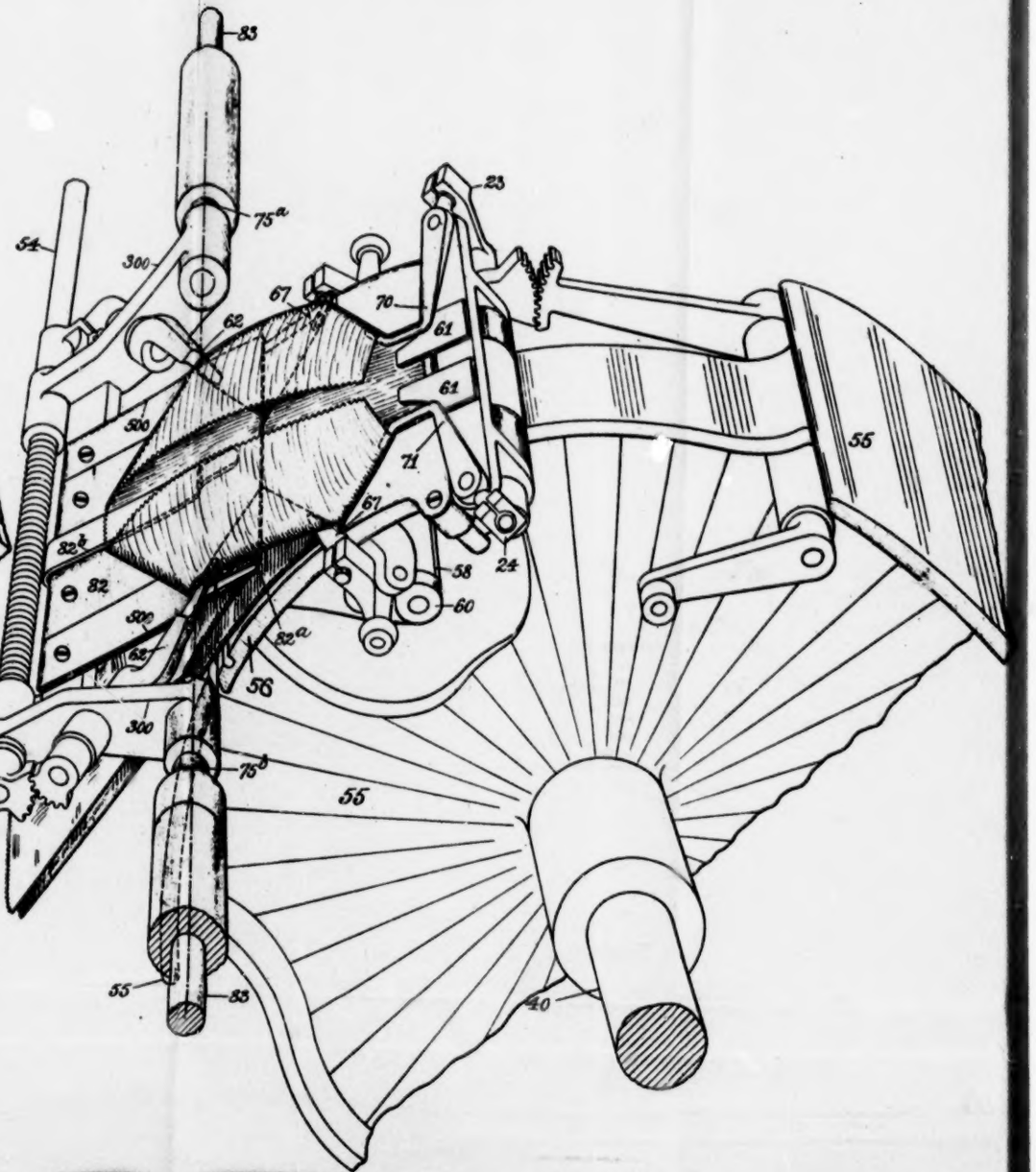


Fig. 3



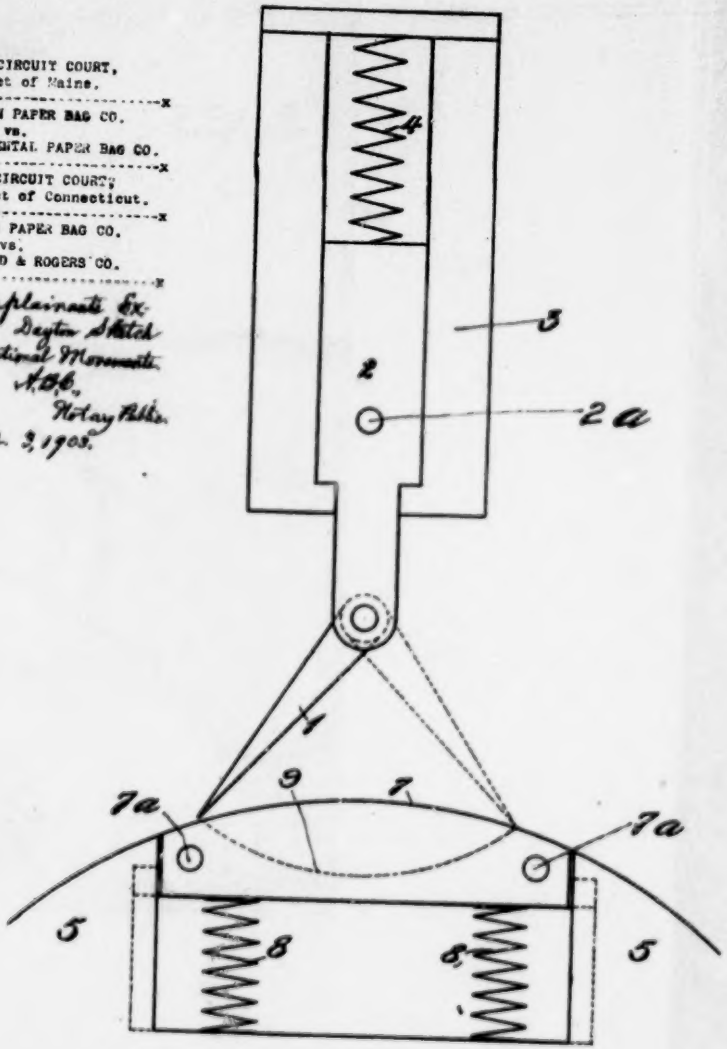
U. S. CIRCUIT COURT,
District of Maine.

EASTERN PAPER BAG CO.
vs.
CONTINENTAL PAPER BAG CO.

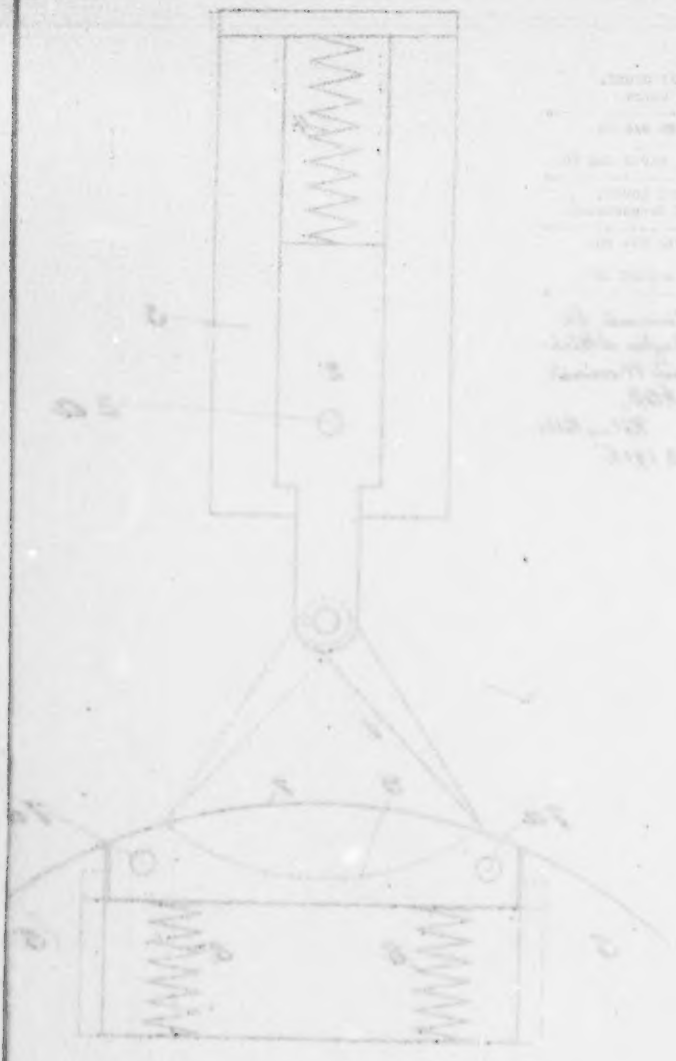
U. S. CIRCUIT COURT,
District of Connecticut.

EASTERN PAPER BAG CO.
vs.
WOODWARD & ROGERS CO.

Complainants Exhibit Dayton Sketch Optional Movements.
A.B.C.
Notary Public.
Dec. 2, 1903.

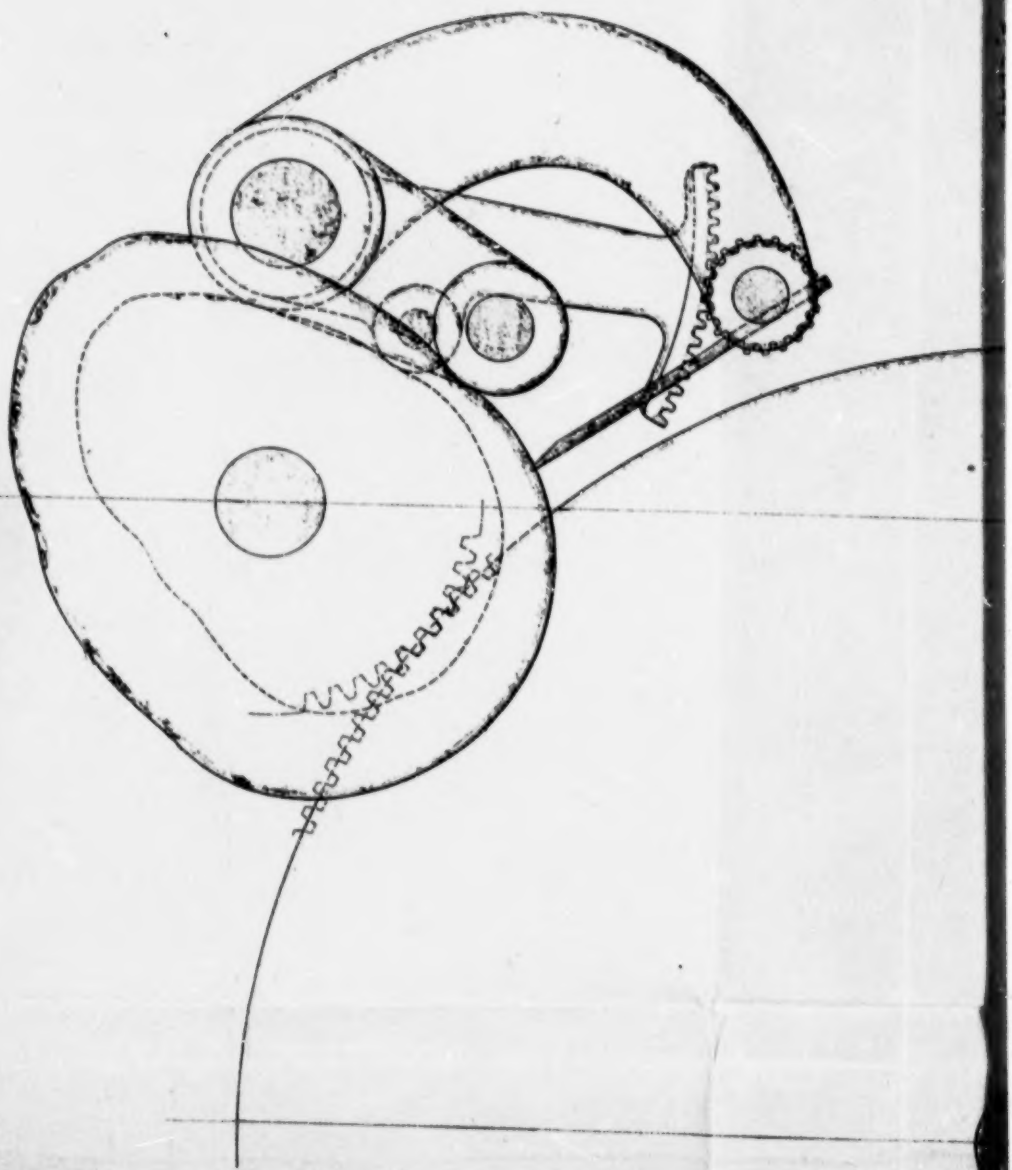


Complainants Exhibit.
Dayton Sketch Optional Movements.
A.B.C. Notary Public.
Dec. 2 1903.



Carl J. Dilloch

Fig. 1



Liddell Paper Bag Machine.

Two Modified Forming Plate Operating Plans.

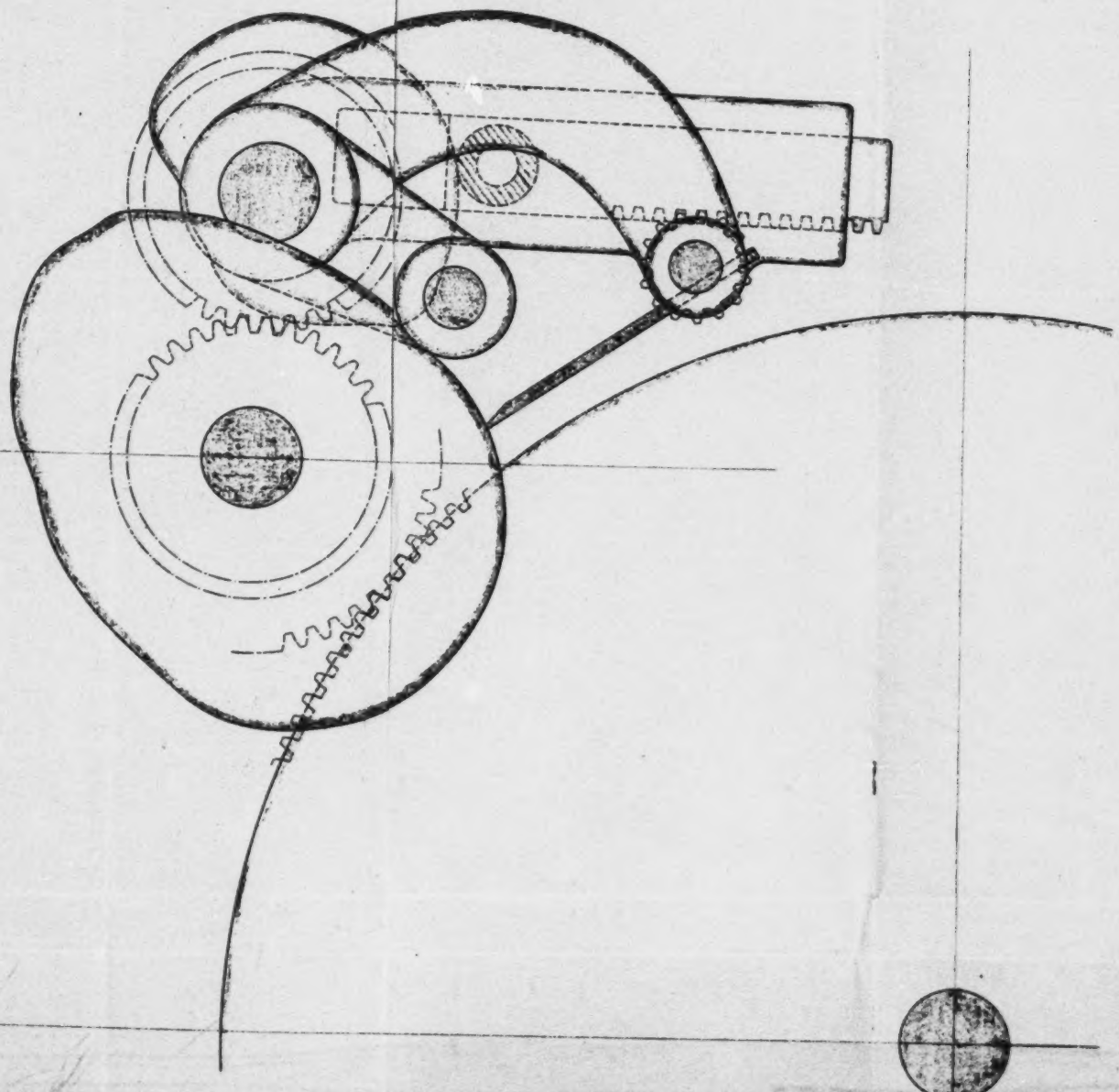
Fig. 2

U. S. CIRCUIT COURT,
District of Maine.

EASTERN PAPER BAG CO.
v.
CONTINENTAL PAPER BAG CO

EASTERN PAPER BAG CO.
v.
WOODWARD & ROGERS CO.

COMPLAINANT'S EXHIBIT
LIDDELL PAPER BAG MACHINE. TWO MODIFIED FORMING PLATE OPERATING PLANS.
A.B.C.,
Notary Public,
Dec. 3, 1903.



Carl J. Dietrich

Liddell Paper Bag Machine.

Cams K and K[1]

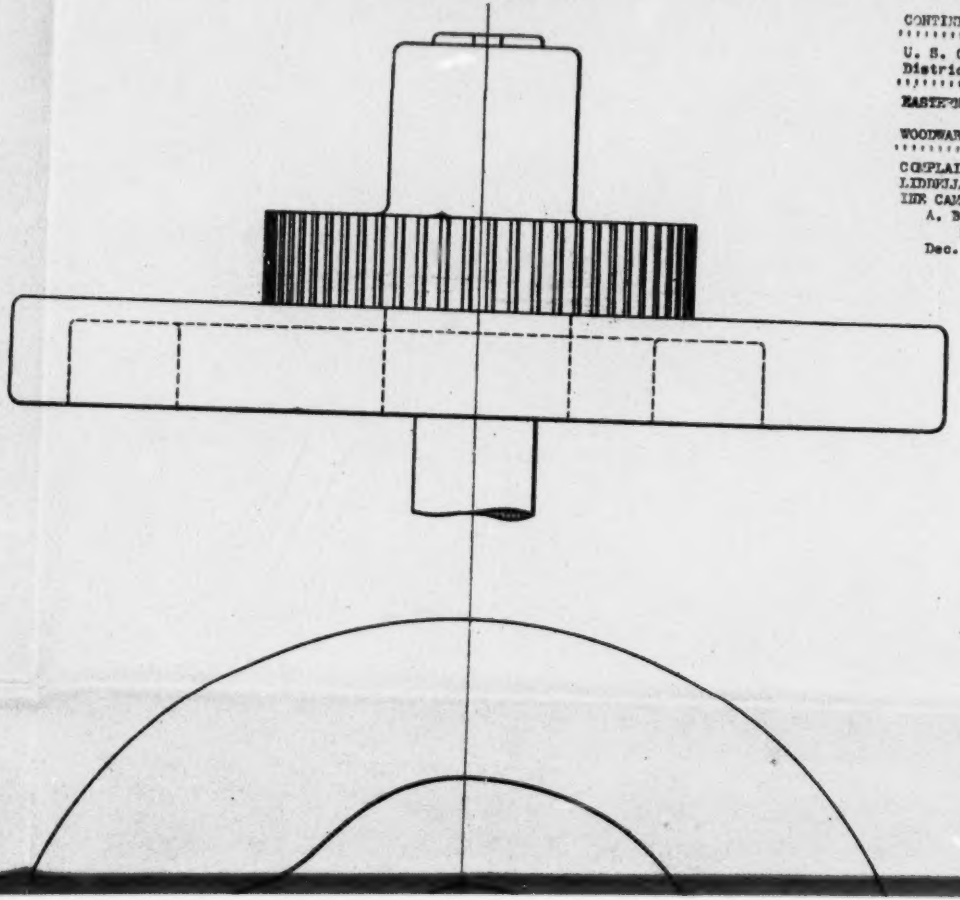
U. S. CIRCUIT COURT,
District of Maine.

EASTERN PAPER BAG CO.
v.
CONTINENTAL PAPER BAG CO

U. S. CIRCUIT COURT,
District of Connecticut

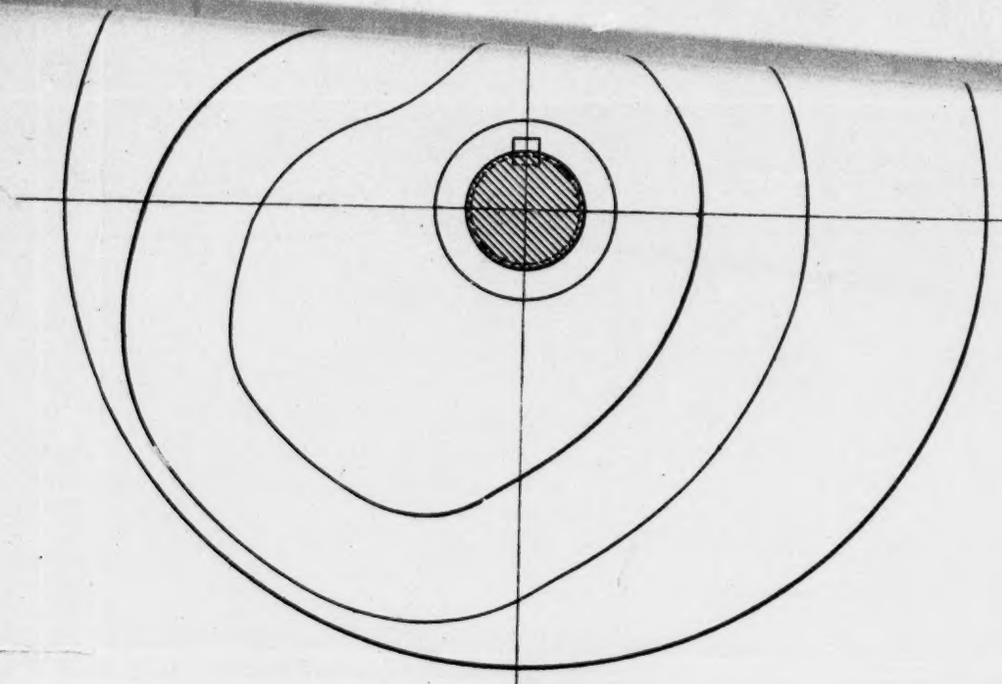
EASTERN PAPER BAG CO.
v.
WOODWARD & ROGERS CO.

COMPLAINANT'S EXHIBIT
LIDDELL PAPER BAG MACHINE CAMS K & K[1].
A. B. G.,
Notary Public.
Dec. 3, 1903.

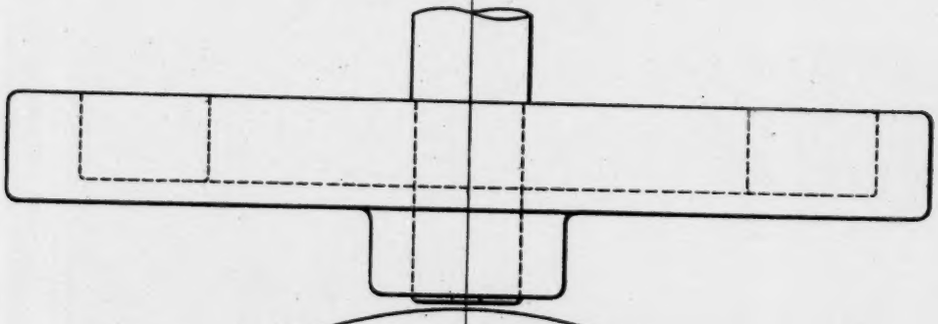


Plan View

Cam K

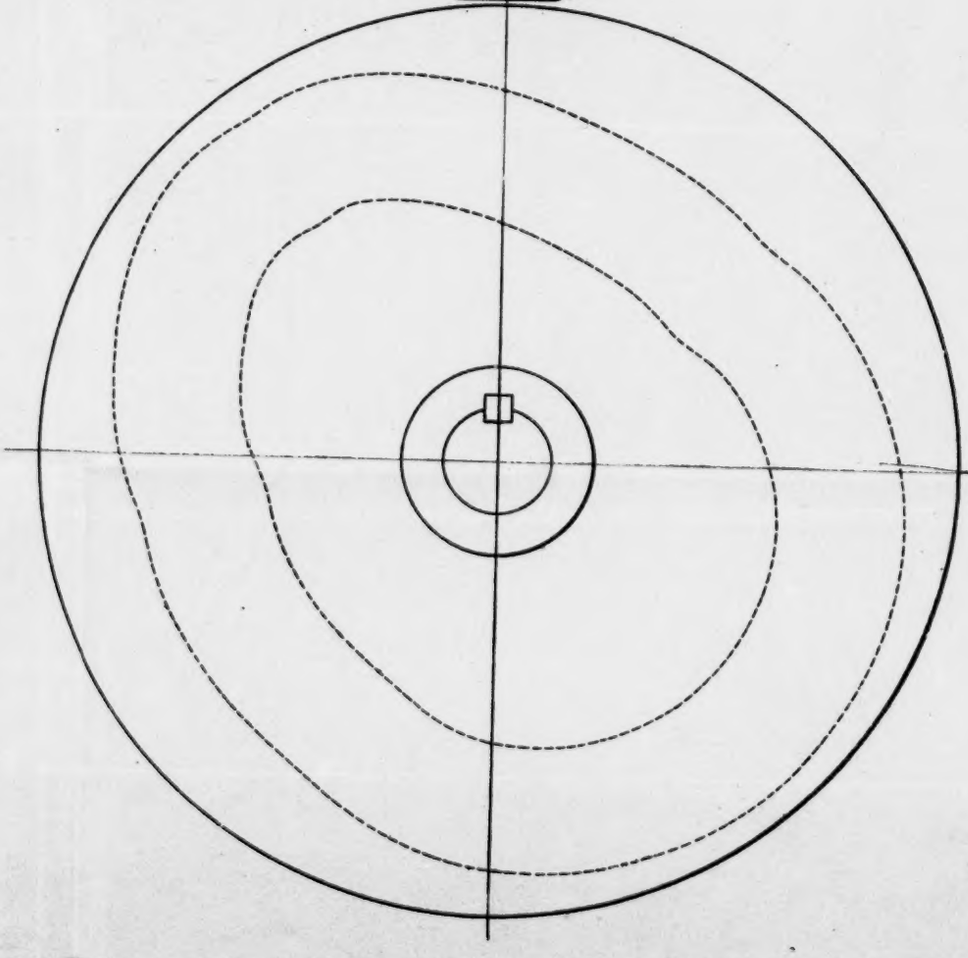


Side View



Plan View

Cam K[1]



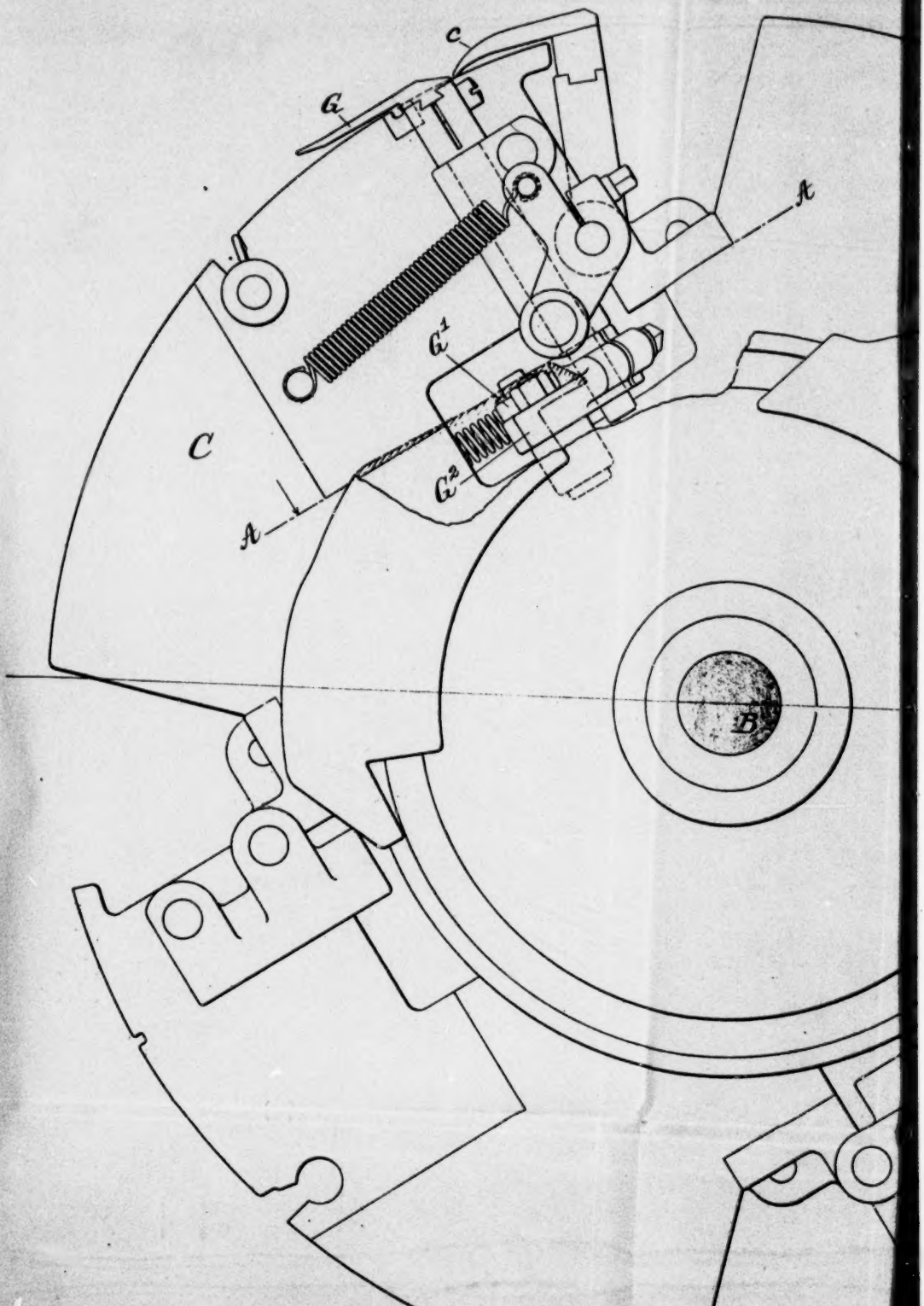
Side View

920

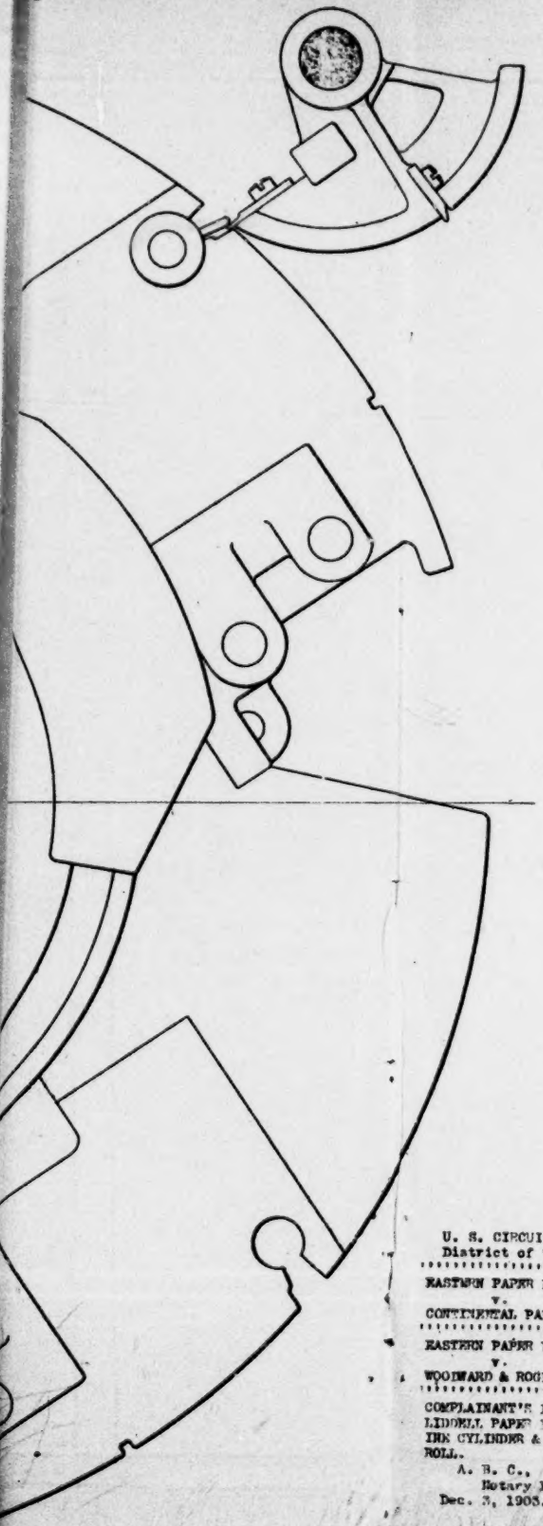
Earl J. Dittrick

Fig. 1

Right Side View



...Paper Bag Machine.
...ylinder and Paster Roll.



U. S. CIRCUIT COURT,
District of Maine.

EASTERN PAPER BAG CO.
v.
CONTINENTAL PAPER BAG CO

EASTERN PAPER BAG CO.
v.
WOODWARD & ROGERS CO.

COMPLAINANT'S EXHIBIT
LIDDELL PAPER BAG MACHINE CYLINDER & PASTER ROLL.

A. B. C.,
Notary Public.
Dec. 3, 1903.

Fig. 2
Left Side View.

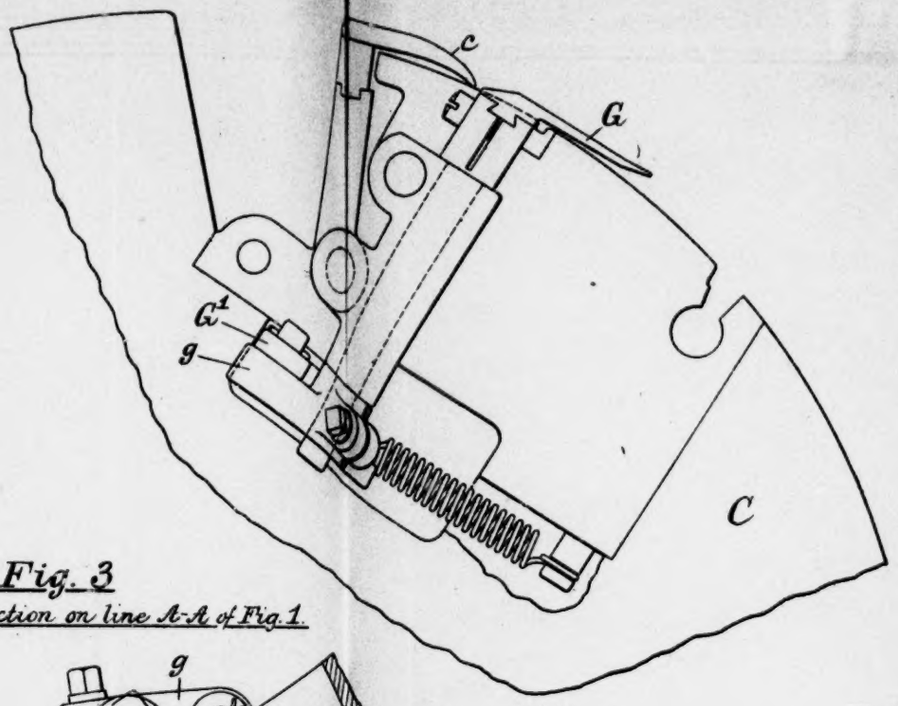
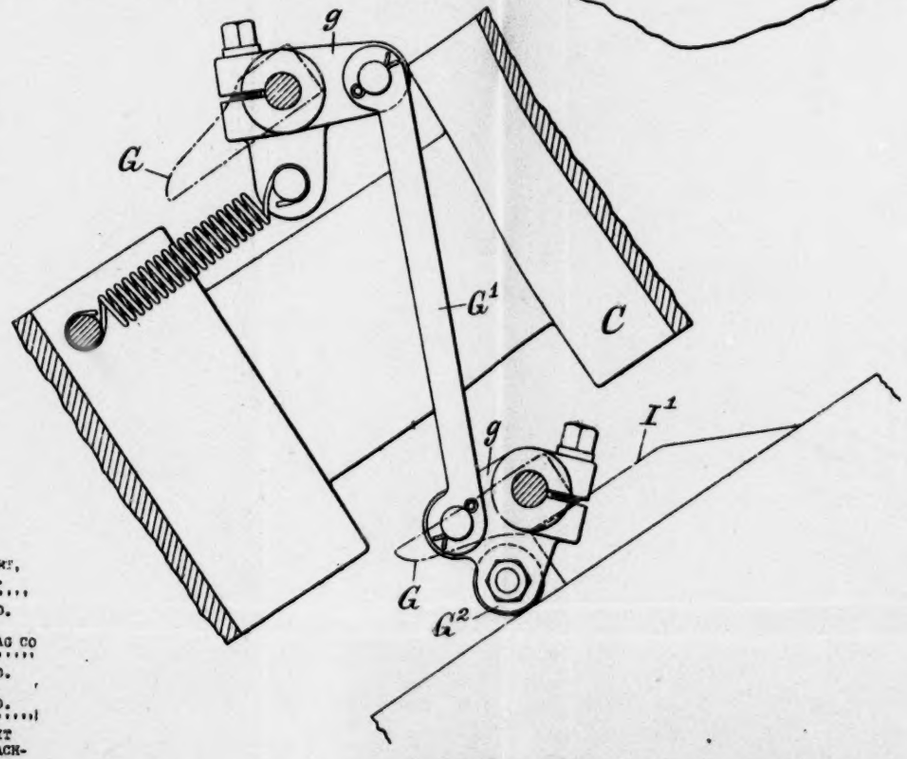


Fig. 3
Plan in section on line A-A of Fig. 1.



Carl J. Dittrich

Bent Flattening Plate 'A'.

L

Fig. 1.
Plan View

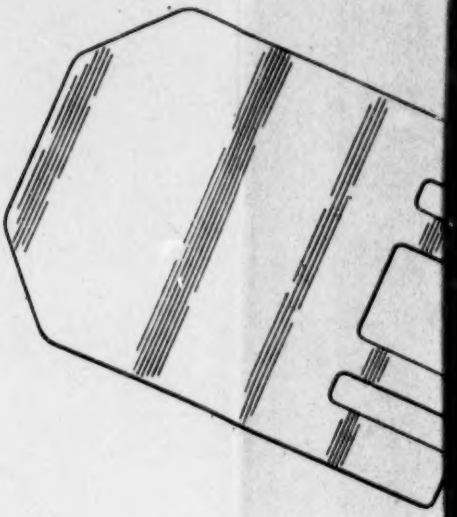
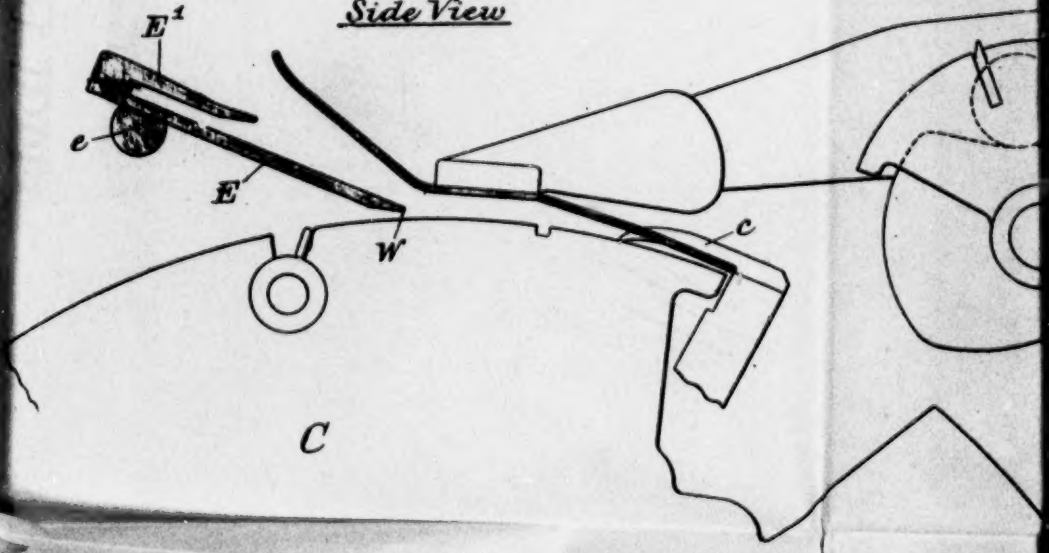


Fig. 2.
Side View



tening Plates of Paper Bag Machine.

Flat Flattening Plate 'B.'

U. S. CIRCUIT COURT,
District of Maine.

EASTERN PAPER BAG CO.
v.
CONFIDENTIAL PAPER BAG CO

U. S. CIRCUIT COURT,
District of Connecticut

EASTERN PAPER BAG CO.
v.
WOODWARD & ROGERS CO.

COMPLAINANT'S EXHIBIT
FLATTENING PLATES OF
LIDDELL PAPER BAG MACHINE.

A. B. C.,
Notary Public,
Dec. 5, 1903.

Fig. 3.
Plan View

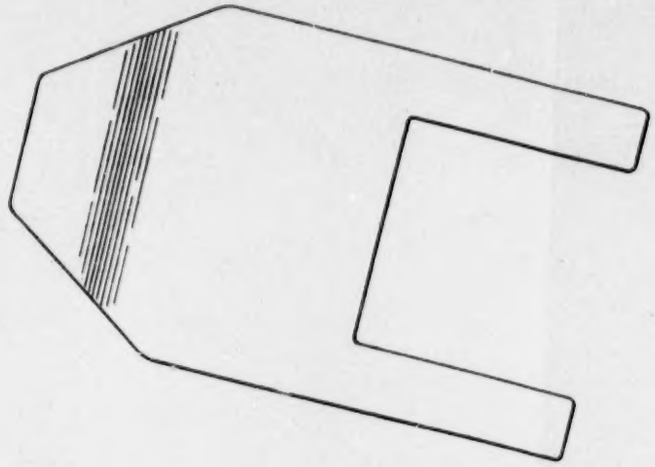
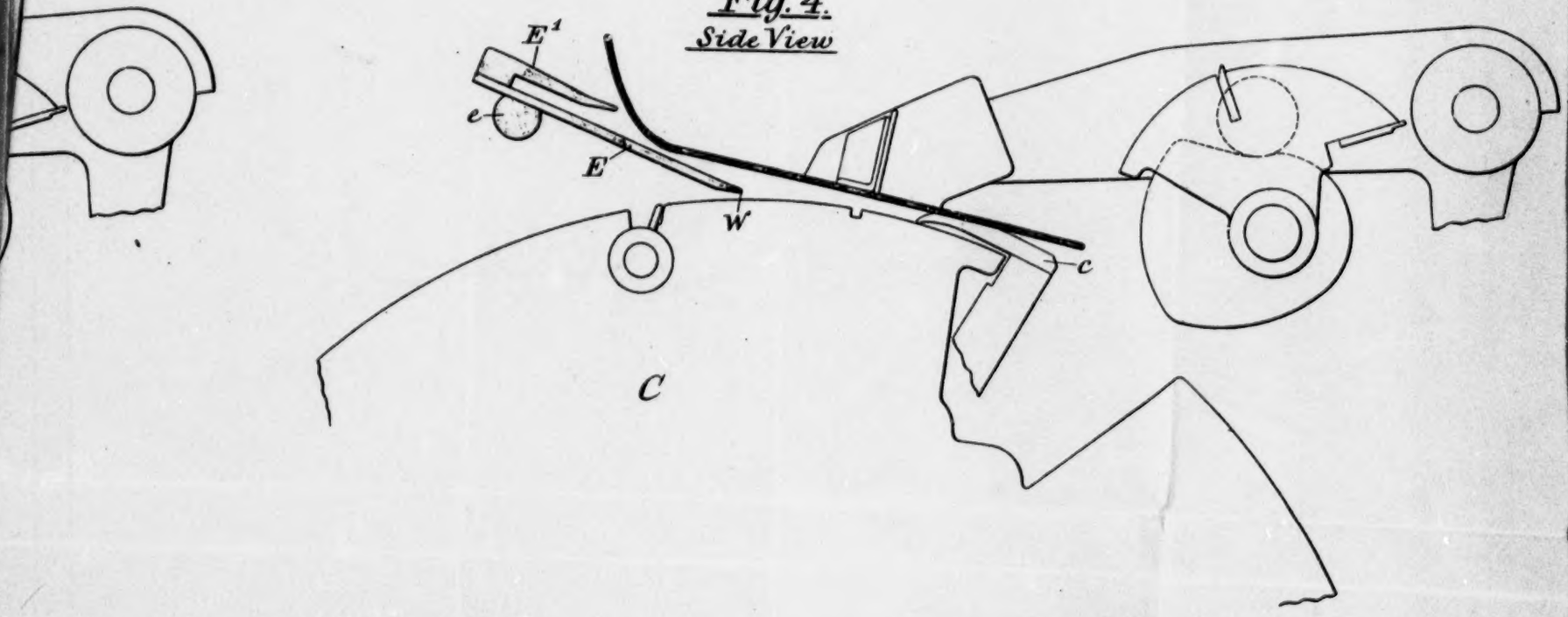
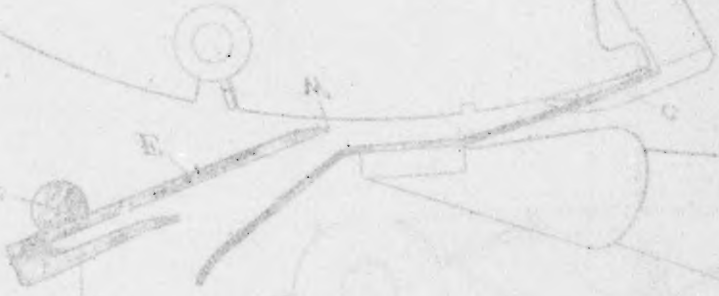


Fig. 4.
Side View



Earl J. Da


C
A
E
B
E1

Liddell Paper Bag Machine.

Forming Plates Showing Modified Positions of Trunnions.

U. S. CIRCUIT COURT,
District of Maine.

EASTERN PAPER BAG CO.
v.
CONTINENTAL PAPER BAG CO

U. S. CIRCUIT COURT,
District of Connecticut.

EASTERN PAPER BAG CO.
v.
WOODWARD & ROGERS CO.

COMPLAINANT'S EXHIBIT
LIDDELL PAPER BAG MACHINE. FORMING PLATES SHOWING MODIFIED POSITIONS OF TRUNNIONS
A. B. C.,
Notary Public,
Dec. 7, 1903.

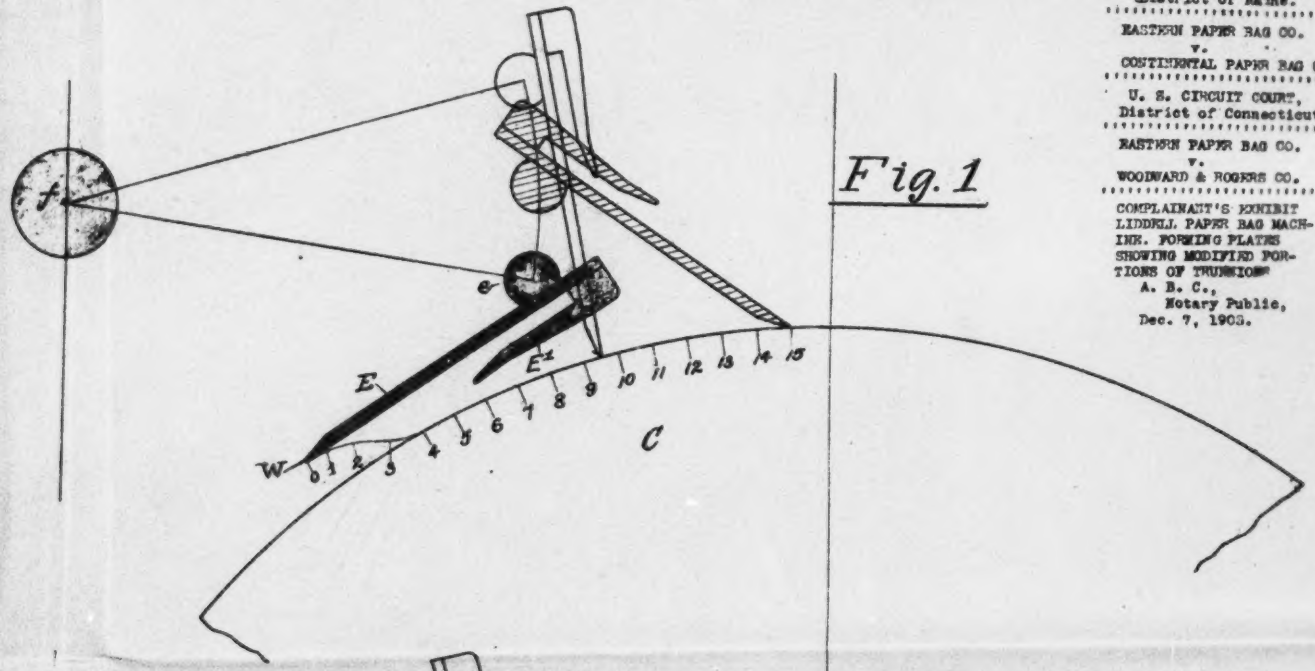


Fig. 1

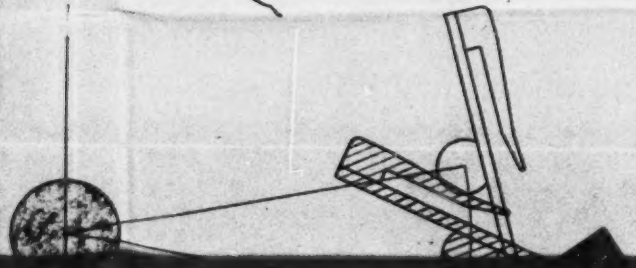


Fig. 2

Fig. 2

Fig. 3

Carl J. Dietrich

UNITED STATES CIRCUIT COURT,

FOR THE DISTRICT OF CONNECTICUT.

EASTERN PAPER BAG COMPANY

vs.

WOODWARD & ROGERS COMPANY.

Stipulation.

Whereas, The defendant's defence in this case is being conducted at the expense of the Continental Paper Bag Company, a corporation created and existing in due form of law in the State of Maine; and by an attorney employed by the Continental Paper Bag Company for that purpose; and, whereas, the same attorney is conducting the defence of the Continental Paper Bag Company, in the case of the Eastern Paper Bag Company vs. the Continental Paper Bag Company, now pending in the United States Circuit Court for the District of Maine; and whereas, this case of the Eastern Paper Bag Company vs. the Woodward & Rogers Company, is based upon the manufacture of certain paper bag machines, upon the use of which, and of other like paper bag machines, the said case of the Eastern Paper Bag Company vs. the Continental Paper Bag Company, is based; and whereas, the attorney for the defendants in both cases, proposes to make the same set of defences in each case; and whereas, that set of defences may call for the same or a similar reply from the complainant, in each case; and whereas, it is the desire of both parties, to diminish the expense of the litigation, without delaying the progress of either suit,

Now, THEREFORE, it is hereby stipulated by and between the parties to the above entitled case of the Eastern Paper Bag Company vs. the Woodward & Rogers Company, that correct printed copies of the defendant's evidence to be taken in the

308 case of the Eastern Paper Bag Company vs. the Continental Paper Bag Company, and correct printed copies of the complainant's evidence in that case, in reply to the defendant's evidence, may be filed before hearing, and if filed, may be read and used in this case of the Eastern Paper Bag Company vs. the Woodward & Rogers Company, with the same effect as the original evidence to be taken in the case of the Eastern Paper Bag Company vs. the Continental Paper Bag Company, if that original evidence had been taken in the case of the Eastern Paper Bag Company vs. the Woodward & Rogers Company; and that the models, drawings, and other physical exhibits which are to be put in evidence by the parties in the case of the Eastern Paper Bag Company vs. the Continental Paper Bag
309 Company, may be physically marked in the Woodward & Rogers case with the same designations as exhibits, and if so marked, may be presented to the court in this case of the Eastern Paper Bag Company vs. the Woodward & Rogers Company, and used with the same effect as if they had been put in evidence in this case. But defendant's counsel to avail himself of this stipulation must, in writing, and before closing his testimony for the defence in the Continental Paper Bag Company case, designate to complainant's counsel therein, exactly, what evidence and exhibits from said Continental Paper Bag Company case, he proposes to use as original evidence and exhibits, in the Woodward & Rogers case, and correspondingly, complainant's counsel to avail themselves of this stipulation, must, in writing, and before closing their testimony in reply in the Con-
310 tinental Paper Bag Company case, designate to defendants' counsel therein, exactly what evidence and exhibits from said Continental Paper Bag Company case they propose to use as original evidence and exhibits, in the Wodward & Rogers case. This stipulation further, is without prejudice, to either party, within their time open for testimony, introducing proofs in this case additional to those taken in the Continental Paper Bag Company case in Maine, if and as advised.

Signed December 4, 1902.

L. F. H. BETTS,
Counsel for the Complainant.
ALBERT H. WALKER,
Counsel for the Defendants.

UNITED STATES CIRCUIT COURT, 2311

DISTRICT OF CONNECTICUT.

EASTERN PAPER BAG COMPANY,
Complainant,

vs.

WOODWARD & ROGERS COMPANY,
Defendant.

In Equity on Letter Patent No. 558,969.

To Albert H. Walker, Esq., Counsel for the Defendant in the above entitled case: 2312

You are hereby notified, in accordance with the stipulation which was made by and between the parties to the above-entitled case, on December 4, 1902, and which was filed in the Office of the Clerk of the Court, on December 10, 1902, that correct printed copies of portions of complainant's evidence, which has heretofore been taken in the case of Eastern Paper Bag Company vs. Continental Paper Bag Company (now pending in the United States Circuit Court for the District of Maine) will be used as original evidence on behalf of the complainant, in this case of the Eastern Paper Bag Company vs. Woodward & Rogers Company; and that certain models, drawings and other physical exhibits, which have heretofore been put in evidence 2313 by the complainant in the case of Eastern Paper Bag Company vs. Continental Paper Bag Company will be used on behalf of the complaint, as original evidence in this case of Eastern Paper Bag Company vs. Woodward & Rogers Company.

And you are hereby specifically notified, that the said printed copies of portions of the complainant's evidence, which has heretofore been taken in the case of Eastern Paper Bag Company vs. Continental Paper Bag Company, will comprise a number of printed volumes, which will include a correct printed copy of each of the following depositions, which have

2314 heretofore been taken on behalf of the complainant in the said case of Eastern Paper Bag Company vs. Continental Paper Bag Company:

The deposition of Melville E. Dayton, which was begun November 6, 1903, and which was finished January 21, 1904.

The deposition of Rudolph M. Hunter, which was begun July 23, 1903, and which was finished July 30, 1903.

The deposition of Ernest H. Hunter, which was begun March 11, 1904, and which was finished March 16, 1904.

The deposition of Samuel R. Betts, which was taken June 18, 1904.

And you are hereby specifically notified that the said
2315 printed volumes will also include a correct printed copy of each of the following documentary exhibits:

Complainant's Exhibit, Notice of Infringement.

Complainant's Exhibit, Walker Opinion.

Complainant's Exhibit, Liddell Contract of Nov. 14, 1901.

Complainant's Exhibit, Coburn-Liddell Letter of November 13, 1902.

Complainant's Exhibit, Coburn-Liddell Letter of November 20, 1902.

Complainant's Exhibit, Liddell Contract of Jan. 12, 1893.

Complainant's Exhibit, Liddell Contract of Oct. 5, 1894.

Complainant's Exhibit, Walker-Liddell Letter of February 26, 1903.

2316 Complainant's Exhibit, Notice of Taking Testimony on June 4, 1902.

Complainant's Exhibit, Hunter File of Case A.

Complainant's Exhibit, Hunter File of Case B.

Complainant's Exhibit, File Wrapper and Contents Liddell Patent in Suit.

And you are further specifically notified that the said correct printed copies of the complainant's evidence which has heretofore been taken in the case of Eastern Paper Bag Company vs. Continental Paper Bag Company, will include a number of printed volumes, which will include correct official

copies of Letters Patent of the United States of America, which 2317
were offered in evidence on behalf of the complainant, as follows:

Complainant's Exhibit No. 6, Claussen Patent 598,497.
Complainant's Exhibit, Claussen Patent 574,020.

And you are further specifically notified that the said correct printed copies of the complainant's evidence in the case of Eastern Paper Bag Company vs. Continental Paper Bag Company will include a number of printed volumes, which will include a correct photolithographic copy of each of the following drawings, photographs and blue-prints; and which drawings, photographs and blue-prints have been put in evidence by the complainant in the case of Eastern Paper Bag Company 2318
vs. Continental Paper Bag Company:

Complainant's Exhibit, Drawing Liddell Machine Parts Opening Diamond.
Complainant's Exhibit, Drawing Liddell Forming Plate Opening Parts.
Complainant's Exhibit, Drawing Liddell Cam Delineating Devices.
Complainant's Exhibit, Dayton Sketch Optional Movements.
Complainant's Exhibit, Liddell Paper Bag Machine, Two Modified Forming-Plate Operating Plans.
Complainant's Exhibit, Drawing Walker Model Room Machine Perspective Views. 2319
Complainant's Exhibit, Liddell Paper Bag Machine Cams K and K^1.
Complainant's Exhibit, Liddell Paper Bag Machine Cylinder and Paster-Roll.
Complainant's Exhibit, Flattening Plates of Liddell Paper Bag Machine.
Complainant's Exhibit, Liddell Paper Bag Machine—Forming Plate Showing Modified Positions of Trunnions.
Complainant's Exhibit, Liddell Original Sketch.
Complainant's Exhibit, Liddell Machine, Photo. No. 1.

2320 Complainant's Exhibit, Liddell Machine, Photo. No. 2.
Complainant's Exhibit, Liddell Machine, Photo. No. 3.
Complainant's Exhibit, Liddell Machine, Photo. No. 4.
Complainant's Exhibit, Liddell Machine, Photo. No. 5.

And you are further specifically notified that the original exhibits of drawings, photographs and blue-prints which have been put in evidence by the complainant in the said case of Eastern Paper Bag Company vs. Continental Paper Bag Company, and which will be used as evidence in this case of Eastern Paper Bag Company vs. Woodward & Rogers Company, include the following, viz.:

All of those mentioned just above and under the notice re-
2321 ferring to correct photolithographic copies of drawings, photographs, and blue-prints just above given.

And you are further specifically notified that the models and other physical exhibits which have heretofore been put in evidence by the complainant in the said case of Eastern Paper Bag Company vs. Continental Paper Bag Company, and all of which will be used as original evidence in this case of Eastern Paper Bag Company vs. Woodward & Rogers Company, include the following:

Complainant's Exhibit, Operative Machine of Liddell Patent in Suit.

Complainant's Exhibit, Liddell Machine, Lion Paper 100
2322 Bags.

Complainant's Exhibit, Liddell Machine, Buffalo Paper 100 Bags.

Complainant's Exhibit, Liddell Machine, Elephant Paper 100 Bags.

Complainant's Exhibit, Liddell Machine, Elephant Paper 100 Bags, Highest Speed.

Complainant's Exhibit, Waste of Lion Paper Run.

Complainant's Exhibit, Waste of Buffalo Paper Run.

Complainant's Exhibit, Waste of Elephant Paper Run.

Complainant's Exhibit, Waste of Elephant Paper Run at rate of 140 to 144 per Minute. 2323

Complainant's Exhibit, Paper Bag of Claussen Patent No. 574,020.

Complainant's Exhibit, Operative Model from Liddell Drawing No. 1.

Complainant's Exhibit, Dayton Model Optional Movements.

Complainant's Exhibit, Flattening Plate A of Operative Machine of Liddell Patent in Suit.

Complainant's Exhibit, Flattening Plate B, of Operative Machine of Liddell Patent in Suit.

Complainant's Exhibit, Drop Plate from the Old Paper Bag Machine No. 88.

Complainant's Exhibit, Model from Fig. 1, Liddell Patent. 2324

Complainant's Exhibit, New Pointer for Operative Model from Liddell Drawing No. 1.

And this notice is hereby given on this 27th day of June, 1904.

BETTS, BETTS, SHEFFIELD & BETTS,
Solicitors for Complainant.

Service of the foregoing notice is hereby acknowledged this 28th day of June, 1904; but the notice is objected to because it is too late.

ALBERT H. WALKER,
Solicitor for Defendant.

2325

CERTIFICATE OF CLERK OF CIRCUIT COURT.

Clerk's Certificate.

UNITED STATES OF AMERICA, *District of Maine, ss:*

I, James E. Hewey, Clerk of the Circuit Court of the United States for the District of Maine, hereby certify that the seven volumes, entitled as follows:

Volume I., Complainant's Record, Prima Facie Proofs;
Volume II., Complainant's Record, Answering Proofs;
Volume III., Complainant's Record, Exhibit Book;
Volume IV., Defendant's Record, Continental Record, Volume I., Answer and Evidence;
Volume V., Defendant's Record, Continental Record, Volume II., U. S. Patents;
Volume VI., Defendant's Record, Continental Record, Volume III., Exhibits;
Volume VII., Proceedings in Circuit Court;

this certificate being attached to each of said volumes, contain and are a true copy of the record and all proceedings of said Circuit Court in the cause in equity entitled,

No. 546.

EASTERN PAPER BAG COMPANY, Complainant,
v.
CONTINENTAL PAPER BAG COMPANY, Defendant,

in said Circuit Court determined, the Petition for Appeal, Assignment of Errors, Supersedeas Bond on Appeal, Bond on Appeal, Opinion of the Circuit Court, and also the original Citation with acknowledgment of service thereon.

Witness my hand and the seal of said Circuit Court this thirty-first day of January, A. D. 1906.

[SEAL.] JAMES E. HEWEY, *Clerk.*